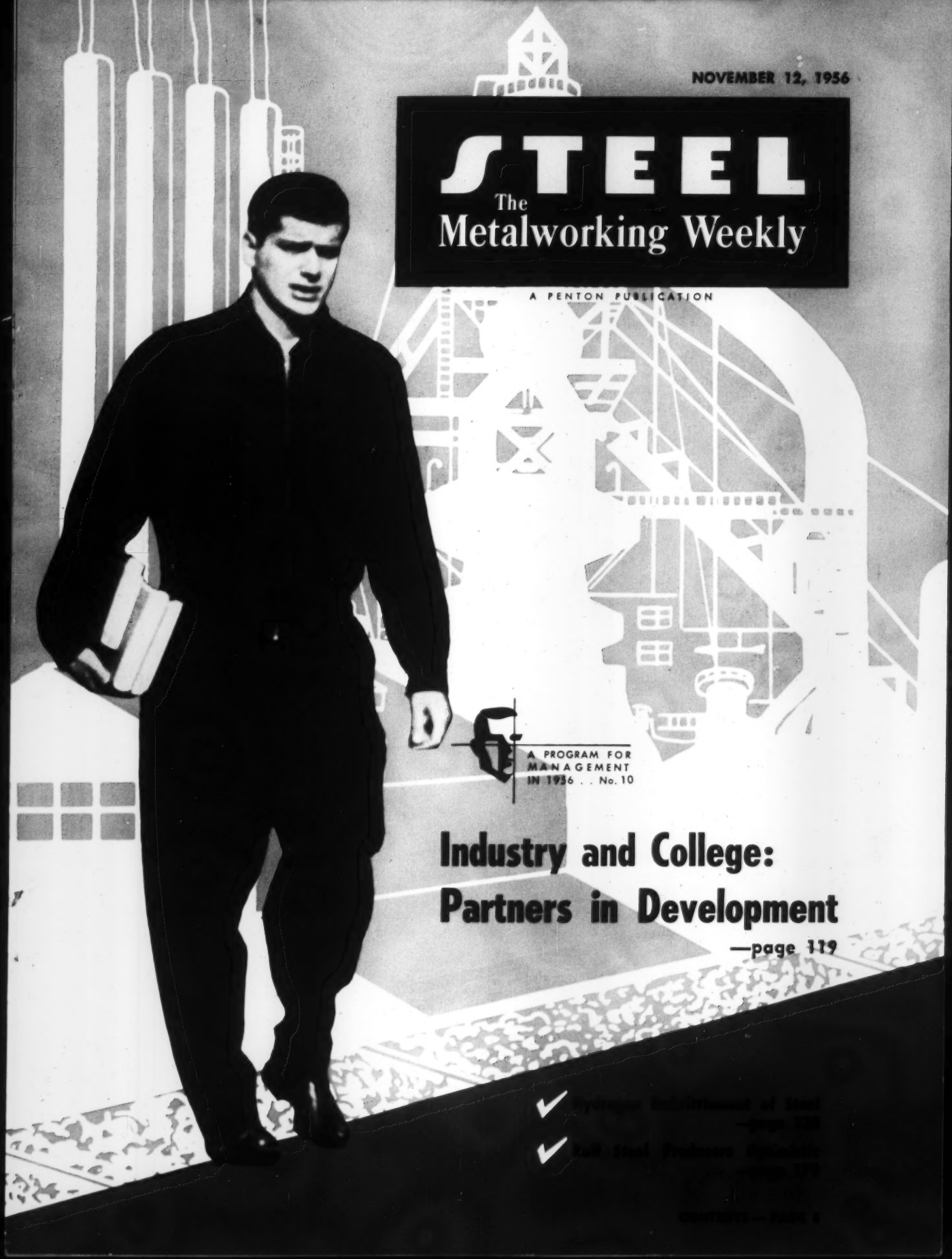
NOVEMBER 12, 1956

STEEL
The Metalworking Weekly

A PENTON PUBLICATION



A PROGRAM FOR MANAGEMENT IN 1956 . . No. 10

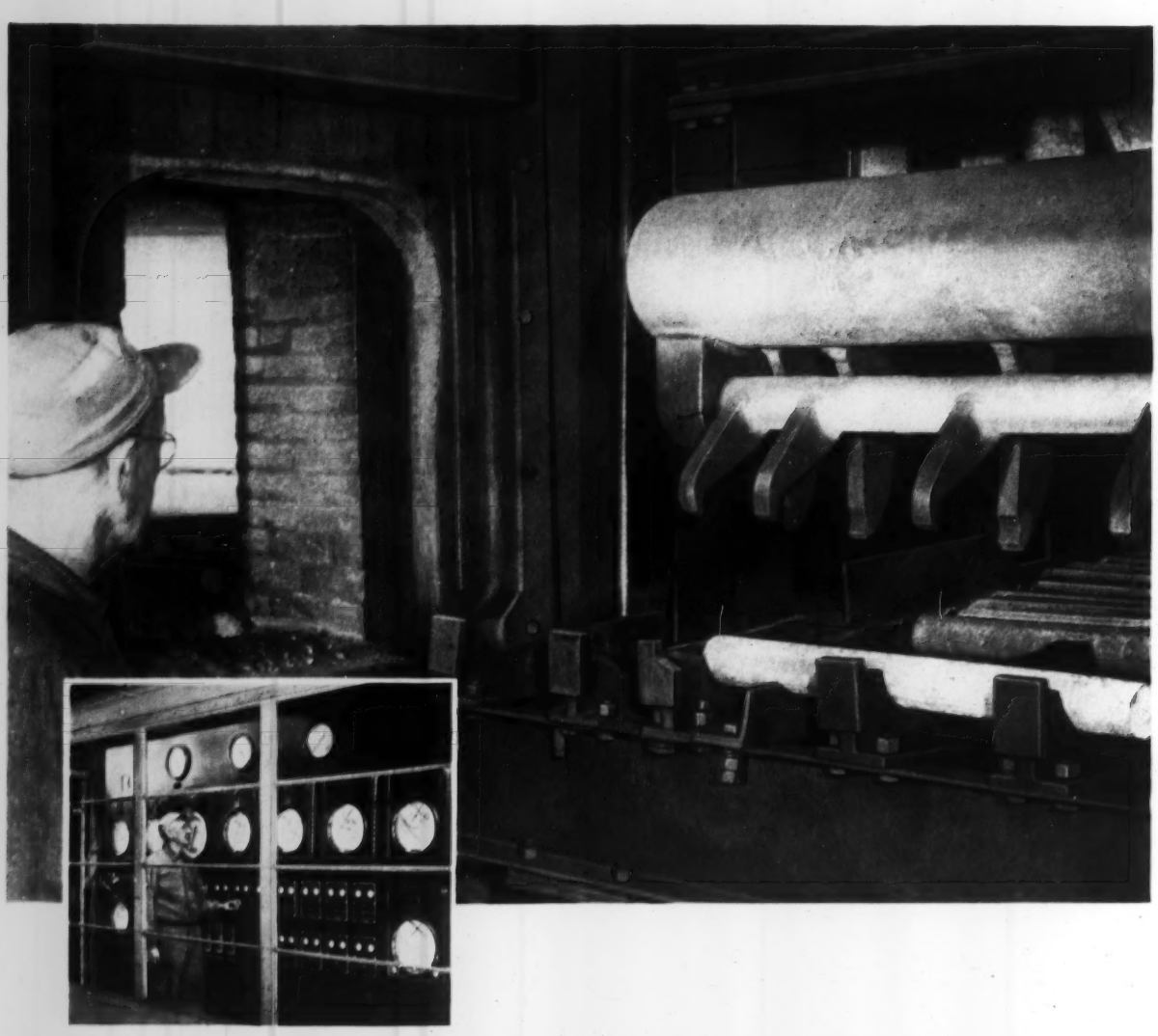
Industry and College: Partners in Development

—page 119

✔ Hydrogen Embrittlement of Steel —page [illegible]

✔ Rail Steel Producers Optimistic —page [illegible]

CONTENTS—PAGE 5



REDUCING MACHINING COSTS OF HOLLOW PARTS

Uniformly-walled tubing minimizes the machining required to produce bearings, bushings, gears or other mechanical parts.

Mike Breit, the "heater" on this rotary billet furnace, in one of B&W's seamless tube mills, does much more than just control the piercing temperatures. He helps control uniformity of tube wall—for only a billet heated evenly to optimum piercing temperatures, with hot and cold spots completely eliminated, has the plasticity which permits piercing it into a seamless tube having dimensional characteristics required for economical production of machined parts.

Mike, who has helped produce thousands of tons of B&W Mechanical Tubing, heated in this specially designed rotary billet furnace, knows that it is a lot easier to pierce dimensional quality into a tube from the start, and certainly much more economical from the user's point of view, than to machine it in later. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.

B&W

TUBULAR PRODUCTS DIVISION

TA-6047(G)

Seamless and welded tubular products, seamless welding fittings and flanges — in carbon, alloy and stainless steels

Fence made from bethanized wire stays strong and bright

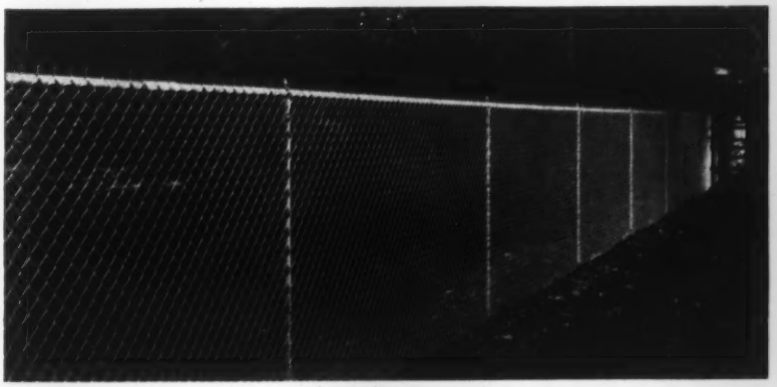
Much of the chain-link fencing is made today from bethanized wire — and for good reasons. The uniform coating of 99-pct-pure zinc protects the wire against corrosion long after other types of fence have become unsightly or rusted away. Bethanized fence keeps its sparkle through years of service because of the tight bond of pure zinc on steel. Fence erectors like bethanized fence because the wires are not rough and won't slash fingers.

Pure zinc, tightly bonded to steel . . . that's bethanized wire

There are no thin spots in the bethanized zinc armor to give rust a foothold. The electrolytic process deposits a coating that is uniform over every inch of the wire.

Bethanized wire is ideal for twisted wire brushes, chain, conveyor belts and other products which require severe forming, swaging, cold-heading, and thread-rolling. You can bend it, twist it around its own diameter — even draw it through dies to fine gage. The pure zinc stays on.

Whether you need hard or soft-temper wire, light or heavy zinc coatings, we will be glad to ship you a trial order of bethanized. Just phone or write our nearest sales office for full details.



The bethanized coating of pure zinc adds extra years of service to chain-link fence. Photo courtesy: Atlas Fence Co., Philadelphia, Pa.

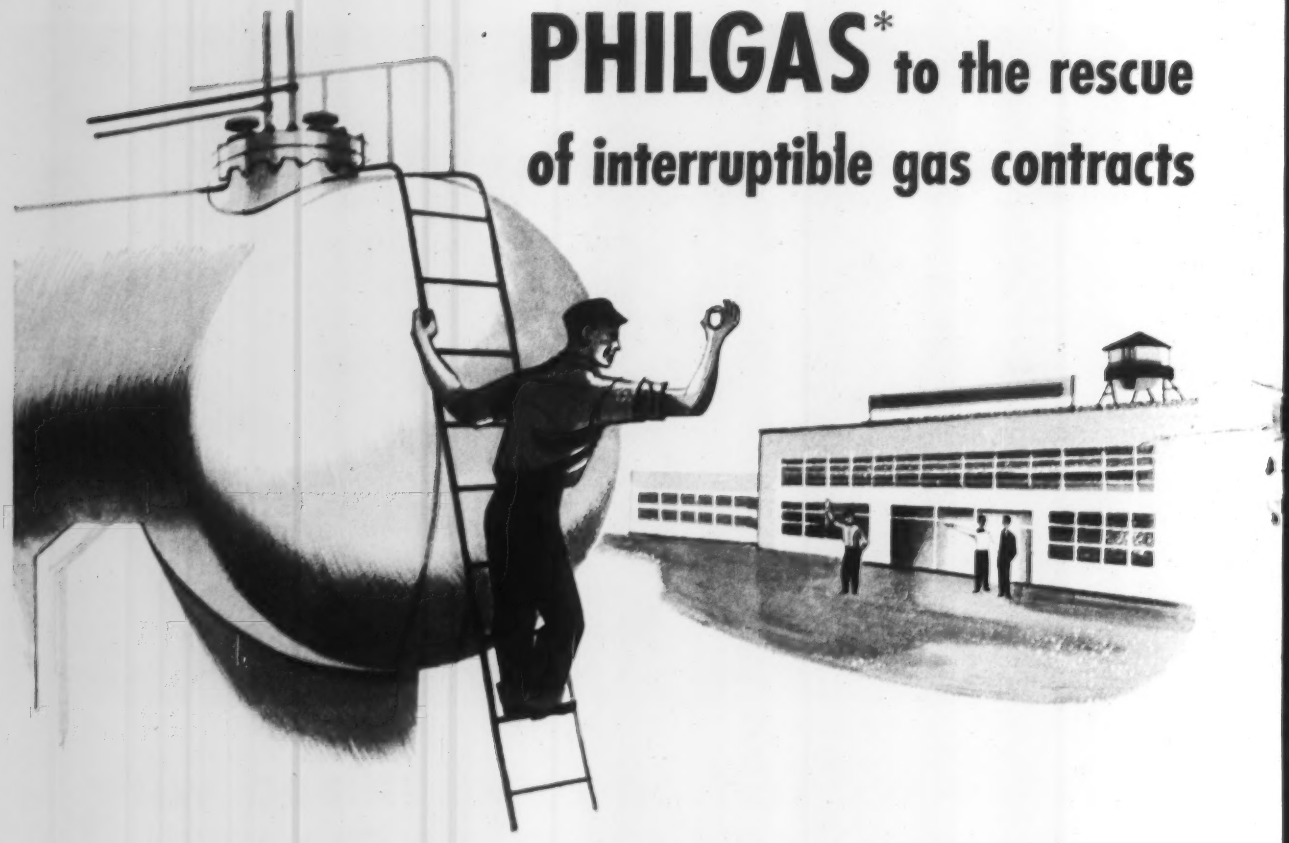
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

PHILGAS* to the rescue of interruptible gas contracts



Your own Philgas system helps avoid shut-downs during peak demands

It will pay you to have a standby Philgas system installed now and be ready for emergencies. Philgas is simple to install . . . requires little capital outlay . . . can be put into operation on short notice. Because a Philgas system is automatic, there are no additional labor costs. It's like having your own gas well!

Philgas is a high-quality Phillips Petroleum Company product that you can absolutely rely on for cleanliness, uniformity and high thermal value. Philgas contract customers are assured of a dependable source of supply at all times. Write for full information about Philgas, America's largest selling LP-Gas.

PHILGAS Is America's Largest Selling Brand of LP-Gas!

Phillips 66 Philgas
THE ALL-PURPOSE FUEL

*PHILGAS is the Phillips Petroleum Company trademark for its high quality LP-Gas or Bottled gas (Butane, Propane).

PHILLIPS PETROLEUM COMPANY

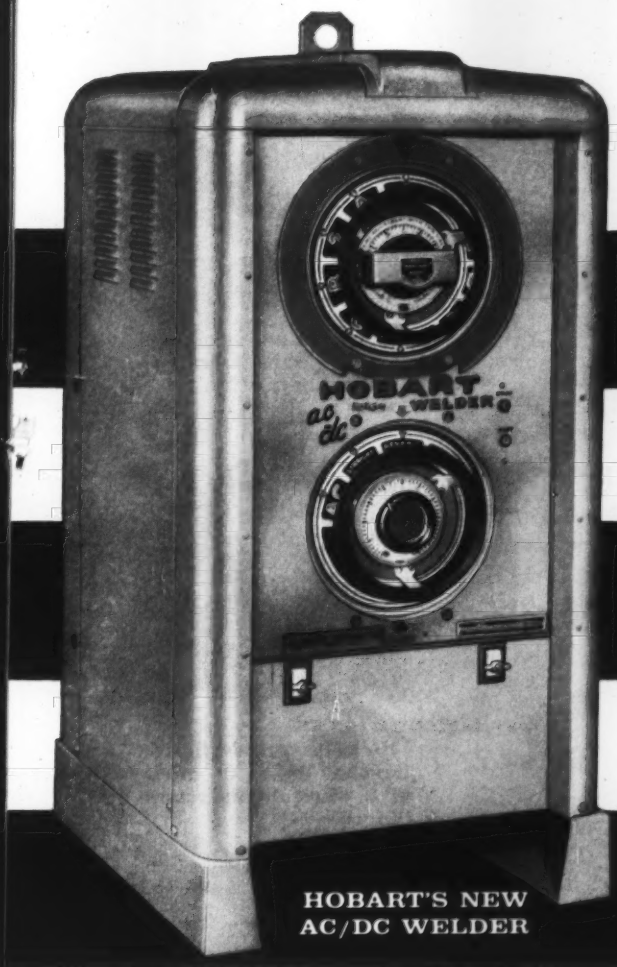
Sales Department • Bartlesville, Oklahoma

Offices located in

Amarillo, Tex., Atlanta, Ga., Chicago, Ill., Denver, Colo., Des Moines, Ia., Houston, Tex., Indianapolis, Ind., Kansas City, Mo., Minneapolis, Minn., New York, N. Y., Omaha, Nebr., Raleigh, N. C., Salt Lake City, Utah, St. Louis, Mo., Tampa, Fla., Tulsa, Okla., Wichita, Kans.

Choose one of these HOBART "cost-cutters"

for welding you can count on to produce MORE PROFIT

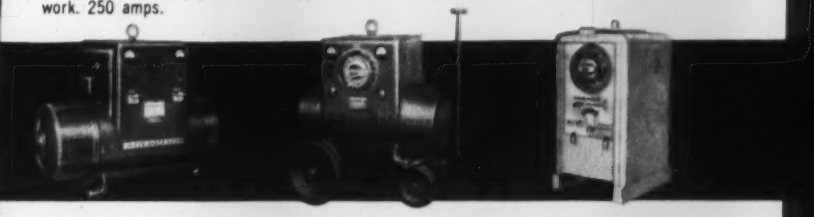


HOBART'S NEW AC/DC WELDER

"CONTRACTOR'S SPECIAL" especially designed for all types of in-the-field construction, repair and pipe line work. 250 amps.

GAS ENGINE DRIVE for field use where electric power is not available. 300 to 600 amps.

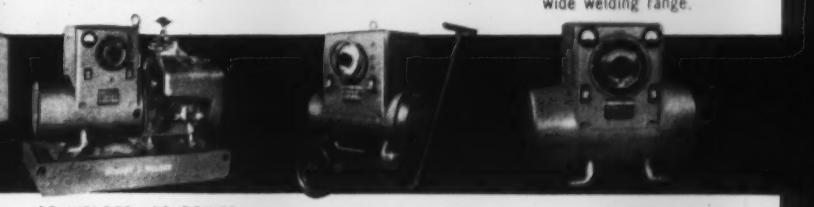
"HUSKY BOY" low cost lightweight aircooled 200 amp. welder for general shop and outside repair work.



"POWROMATIC" eliminates troublesome electronic controls in automatic welding. 400, 600 and 800 amps.

ELECTRIC DRIVE WELDERS for production, maintenance and general shop work. 200 to 600 amp. sizes.

DC RECTIFIER new and improved. Features simplified controls, polarity selector switch, remote control and wide welding range.



AC WELDER—AC POWER COMBINATION gives 200 amps. for welding or 5 KW AC power for operating power equipment.

"BANTAM CHAMP" 250 amp. electric drive for light and medium requirements in general shop use.

"GENERATOR ONLY" 200 or 300 amps. with 1 KW DC power outlet. Couple direct, or V-belt it to your engine.

Rarely do you find such versatility, welding range, great speed and extra features in one welder as you do in this brand new Hobart AC-DC welder. This new Hobart lets you take full advantage of the latest types of electrodes and sizes for both AC or DC welding. In addition to having AC or DC welding, you'll want to see and know about *variations of this model that lets you do Inert Gas Welding.* Such outstanding advantages in Hobart are typical. You can depend on every Hobart welder to give you constant top performance, cooler operation, easier arc control and extra capacity.

HOBART BROTHERS CO., BOX ST-116, Troy, Ohio, Phone 21223.

Hobart

"One of the world's largest builders of arc welders and arc welding equipment"

New, speedier electrodes

Try Hobart's new Rocket 14. Rocket 24 and Rocket 27 for a real surprise. You'll marvel at their speed, ease of handling and their sound, strong welds.

HOBART TROY OHIO **WELDERS**

HOBART BROTHERS COMPANY
BOX ST-116, TROY, OHIO

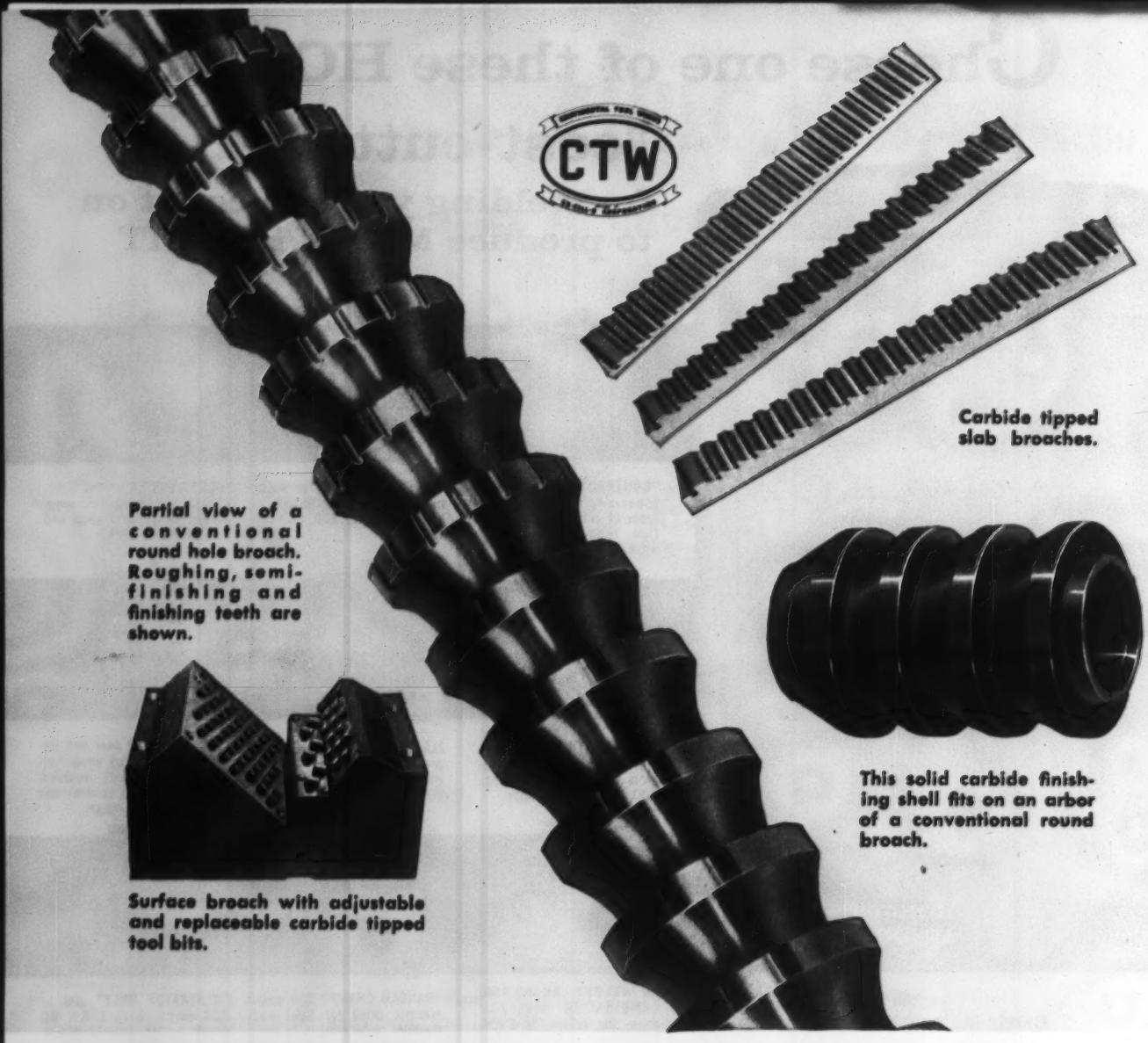
Without obligation, please send me complete information on the items checked below

- ☐ AC-DC Welder
- ☐ "Husky Boy"
- ☐ DC Rectifier
- ☐ "Bantam Champ"
- ☐ "Contractor's Special"
- ☐ "Powromatic"
- ☐ AC Welder—AC Power Combination
- ☐ "Generator Only"
- ☐ Gas Engine Drive
- ☐ Electric Drive

Name _____

Address _____

City _____ State _____



Partial view of a conventional round hole broach. Roughing, semi-finishing and finishing teeth are shown.

Carbide tipped slab broaches.

This solid carbide finishing shell fits on an arbor of a conventional round broach.

Surface broach with adjustable and replaceable carbide tipped tool bits.

Here's Why Continental Quality Broaches Actually Cost Less Than Ordinary Broaches

After all, the price paid for a broach may be only the beginning of broaching expense. To the original cost of the broach must be added the cost of work delays, scrapped parts, and time-consuming adjustments.

However, if the broach is free cutting, holds the required tolerances and finishes, with the maximum pieces per tool, your original cost may be your only cost.

Because Continental effectively combines quality materials, skilled craftsmanship, and engineering experience, it is a fact: "the best broaches cost less."

Continental
TOOL WORKS
Division of
Ex-Cell-O Corporation
Detroit 32, Michigan

56-64

In This Issue

STEEL
The Metalworking Weekly

November 12, 1956 Vol. 139 No. 20

☑ 73 **Metalworking Outlook**—Labor Force of 90 Million by 1975

☑ 77 **Editorial**—After the Election: What?

79 Electronics: Growth Industry of the Decade
81 Progress Report on Supplementary Employment Benefits
82 Shipments of Aluminum Castings Lag
83 Gray Iron Users Speak Their Mind
84 Tool Builders See Big Year Ahead
85 Keep Your Eye on U.S. Industry in Puerto Rico

☑ 86 **Windows of Washington**—No Big Tax Law Changes

89 Importing: Techniques Have Changed
90 Shipping Troubles May Bring Spot Fuel Shortages
91 How To Lick Snow Problem: Melt It as It Lands

☑ 93 **Mirrors of Motordom**—New Car Demand Looks Good

☑ 97 **The Business Trend**—Production Level Depends on Motordom

101 Men of Industry—News About Men You Know
107 Kaiser Aluminum Buys Extrusion Plant in Illinois
119 Industry and College: Partners in Development

☑ 129 **Technical Outlook**—Supertest Facility for Rotors

130 I Have Enough Engineers, Says Solar's Hi Brown
134 Coated Abrasives Move Into Heavy-Duty League
136 Battelle's Nuclear Reactor Ready for Research

☑ 138 **Progress in Steelmaking**—Hydrogen in Steel

147 New Bronze Has 12 Per Cent Manganese
150 Portable Brinell Tester Used for Heavy Parts
152 Stainless in Aircraft Design—Part II
157 New Products and Equipment
172 New Literature

☑ 177 **The Market Outlook**—Troubled World: Who Has the Steel

179 Rail Steel Bar Producers Optimistic
187 Price Indexes and Composites
202 Nonferrous Metals
204 Nonferrous Metal Prices
189 Steel Prices—Ores, p. 195; Ferroalloys, p. 196.
199 Scrap Market Trends—Prices, p. 200
206 Advertising Index

Behind the Scenes, p. 6; Letters, p. 10; Staff, p. 16; Meetings, p. 27; Index available semi-annually. STEEL also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

Published every Monday by The Penton Publishing Co., Penton Bldg., Cleveland 13, O. Subscriptions in the U.S. and possessions and Canada, $10 a year; all other countries, $20. Current issues, 50 cents each. Metalworking Yearbook issue, $2. Accepted as controlled circulation publication at Cleveland. Copyright, 1956, The Penton Publishing Co.

how to trap dust
that damages your machines and hurts company morale

Priced from $190.00

easy-to-move
TORIT DUST COLLECTORS
trap dust at its source!

Untrapped dust costs you money, "secretly" forces precision machines out of line, limits production. Torit dust collectors are unitized for custom installation—save more money, usually more efficient than central (built-into-the-building) system. Torit unit operates only when machine or combination of machines it protects are in use. Filtered air may be returned to room to save heat. Many models and sizes, all self-contained, easy to move. Write today to... DEPT. 506.

TORIT MANUFACTURING COMPANY

311 Walnut Street
St. Paul 2, Minn.

behind the scenes

A Goya Gambit

A beautiful lady reclining on a couch, dressed in nothing but a black velvet throat band and a rose tucked behind her ear couldn't possibly have any connection with STEEL's Program for Management story this week, "Industry and College, Partners in Development" (page 119). Or could it? Well, the lady we have in mind was painted by Francisco de Goya y Lucientes, and interest in the picture shot up when the Duke of Alba saw it and roared: "Carr-ramba! Thees is no lady! Thees is my wife!" You see, background information increases the attention value of any picture; thus, while gossip about Goya's canvas increased its appeal, a few outside facts about STEEL's cover illustration should make it, in turn, more interesting.

The purposeful young man striding across the cover was photographed by an Inland Steel Co. plant photographer at the Indiana Harbor (Ind.) Works, and the picture first appeared on the back cover of the February, 1954, *Inland Steelmen*. STEEL borrowed it a few months later to illustrate an industry-education article, and again this week for use as a cover. The young man is Jim Manous. He is seen leaving the plant and heading for night school, where he took five courses. In January, 1955, he left Inland to take up full-time studies. We are indebted to James M. Zanutto, editor, *Inland News*, for this information.

Press Squeezes in Window

While we are on the subject of pictures, we may as well explain the illustration that tops the right column. Employees of Cleveland Cartage Co. are seen busily stuffing the first installment of a 73,000-lb rotary press through one of the big first floor windows of the Penton Building. Parts in the crates were so large they couldn't be delivered any other way. After it is assembled, this 47 x 72 in. Harris-Seybold will print 5500 sheets an hour. (It's a two color, sheet rotary letterpress.) The more technical reader will be happy to know that this amazing press has form rollers, vibrating rollers, autovibrating rollers and non-vibrating rollers.

The sight of a great trailer backed right up to the building, massive crates being shoved through the walls, traffic backing up to the corner and a general air of excited confusion prompted George O. Hays, president of the Penton Publishing Co., to make a remark.

"Reminds me of a highway sign in Florida," he said, pausing to survey the commotion. "The sign read, 'DETOUR: A SIGN OF PROGRESS.'"

The new rotary press is, indeed, a sign of progress. One doesn't go out and buy one as one might go out and buy a pound of chopped beef. STEEL's new press represents a solid investment in business faith, in the welfare of metalworking and the continued success of our advertisers.

Passage in Manners

Neal Manning, one of STEEL's Cleveland representatives, was the delighted recipient recently of a hand-lettered thank you note from Frank and Ruth Kovacsev. Frank is an executive of the Linde Air Products Co., New York. He and Mrs. Kovacsev were given a room next to the Penton suite at the Cleveland hotel during the Metal Show. They weathered the storm beautifully, and even became friendly with many Pentonites. Their note, while delivered to Manning, was addressed to "all the Shrdlus of Penton Publishing Co.," and expressed thanks for a wonderful time in Cleveland. On behalf of all us Shrdlus, then, let us say that the pleasure was mutual.

Shrdlu

(Metalworking Outlook—Page 73)

New...

ELPAR RAM TRUCKS

ONLY THE "R" SERIES RAM TRUCKS GIVE YOU SO MANY VALUES!

ELPAR designers and major steel mill engineers worked together to design this brand new line of coil handlers.

These trucks combine the best of previous models, plus new features learned from over thirty years' experience building heavy-duty ram trucks. You can count on "R" series ram trucks to handle more tons per hour than ever before!

Check These Design Features:

Narrowest Ram Truck Built . . . Get more efficient use of storage space and operate in narrower aisles.

Power Actuated Hydraulic Wheel Brakes . . . Actually two independent braking systems for maximum safety.

Picture Window Vision . . . Lift chains are eliminated for perfect vision between uprights.

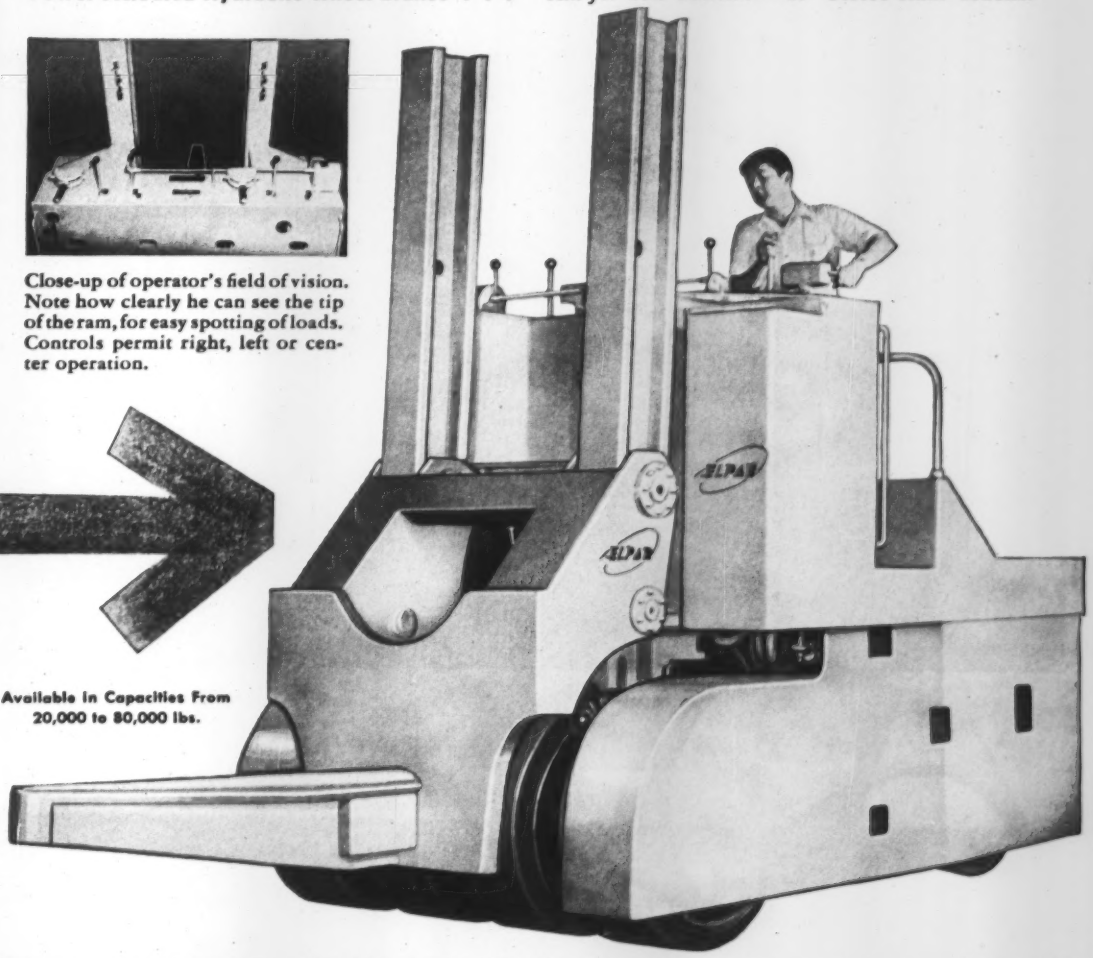
Countless Safety Features . . . You'll find it hard to count all the features that assure safety to the load, operator and truck.

Dual Power Plants . . . Maximum power and flexibility. Drive motors are fully protected inside the frame.

The "R" series ram trucks will surprise you with their dependability, safety and economy.

Ask for new bulletin—"R" Series Ram Trucks.

Close-up of operator's field of vision. Note how clearly he can see the tip of the ram, for easy spotting of loads. Controls permit right, left or center operation.



Available in Capacities From 20,000 to 80,000 lbs.

THE ELWELL-PARKER ELECTRIC CO. • 4106 St. Clair Avenue • Cleveland 3, Ohio

This accurate Cincinnati

Fan casings.

Press Brake saves money and time...

Photos courtesy of Anchor Metal Spinning Company.

at ANCHOR METAL SPINNING CO.
Dayton, Ohio

Profitable production has been achieved by installing this Cincinnati Press Brake.

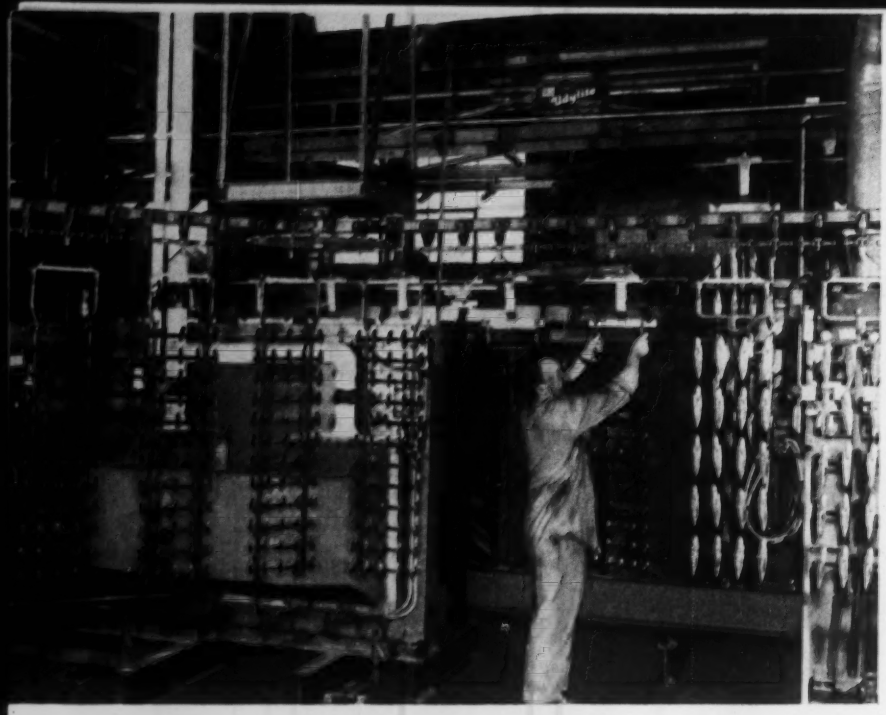
Accurate flanging of fan housings is done rapidly while meeting the rigid requirements for squareness. Operations on different sizes and gauges of materials are performed with ease. Parts for assembly are ready on time and smooth shop operation maintained.

Write for Bulletin "2 New Cincinnati Press Brakes" for complete information on these versatile machines.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

CINCINNATI



QUALITY IMPROVED—PRODUCTION INCREASED WITH UDYLITE PROCESSES AND EQUIPMENT

In the manufacture of rear view automobile mirrors by Yankee Metal Products Corporation of Norwalk, Connecticut, a variety of die cast parts are used. All of these die cast parts are copper, nickel and chrome plated on the Udylite Full Automatic Plating Machine. Shape and sizes of these parts vary considerably.

The Udylite Full Automatic handles the complete processing of the parts from the bare die castings to a finish ready for final assembly. Its operation has provided perfect precision, a doubled capacity and a minimum of rejects.

Udylite Bright Nickel has played an important part in the perfect coverage of these die castings. With the chrome overlay, Udylite Bright Nickel has provided not only the glistening finish demanded for this luxurious line, but also the guaranteed protection for these accessories which are constantly subjected to attack by the elements.

Hand in hand, Udylite equipment and processes are solving many plating problems. Providing sales appeal finishes—plated protection —multiplied production. Find out how you can use these same advantages.

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

WORLD'S LARGEST PLATING SUPPLIER

LETTERS
TO THE EDITORS

Keep the Ball Rolling

I have seen the article, "Steel Challenges the Young" (Oct. 15, page 128), which quotes a portion of my recent speech at the sixtieth anniversary dinner of the Wellman Engineering Co., Cleveland.

If I have helped in even a small way to bring out the industry's needs for technically trained young men and to strengthen or excite the interest of young men in the steel industry, I am pleased.

I hope others will help us keep the ball rolling.

C. L. Austin
Vice Chairman
Jones & Laughlin Steel Corp.
Pittsburgh

Article Is Kind to Magnesium

The article, "Metalworking Tackles the Satellite" (Oct. 15, page 120), is well done. Not only is it complete, but it is kind to magnesium.

If we could have as many as 75 copies, we would be proud to distribute them to the key men of the member companies of the association.

Jerry Singleton
Executive Secretary
Magnesium Association
New York

Automation's Impact on Labor

May we have ten reprints of the article, "Automation—Bogeyman or Bonanza?" (Oct. 15, page 109)? This appears to be the best presentation of the subject (the impact of automation upon labor) we have seen to date.

Charles D. Gibbs
Rod & Wire Division
Industrial Gauges Corp.
West Englewood, N. J.

We would appreciate your permission to use excerpts from this article for our publication, *Operating Briefs*. We would, of course, give due credit.

M. Nachtweih
National Research Bureau Inc.
Chicago

• *Permission is granted.*

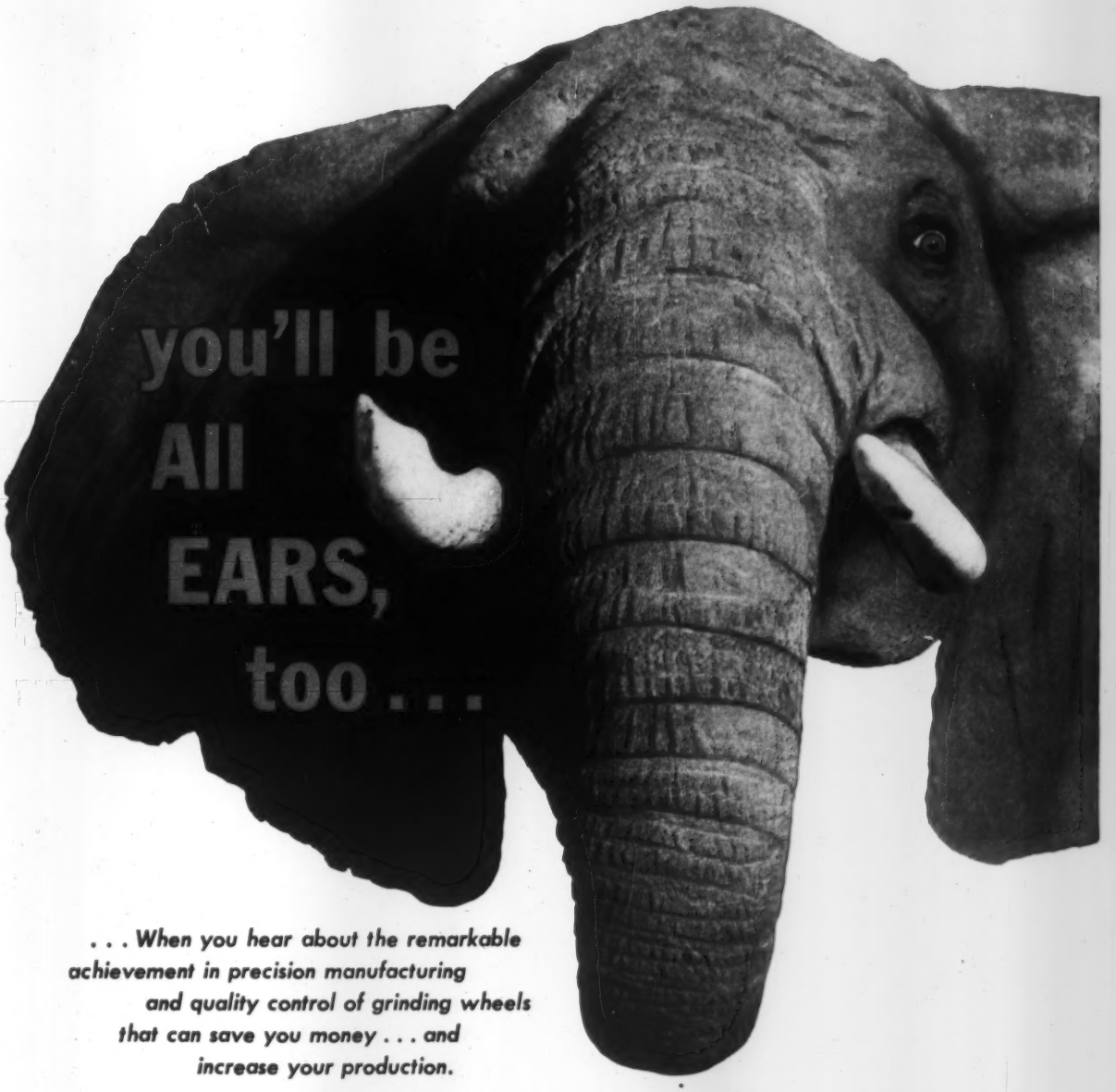
Navy Uses Value Engineering

I would appreciate two copies of the Metal Selector which is included as an insert in the Oct. 1 issue.

This chart furnishes a quick reference for our work in value engineering and can also be used in our hull structural branch where U. S. Naval vessels are designed.

Value engineering is a new money

(Please turn to page 12)



. . . When you hear about the remarkable achievement in precision manufacturing and quality control of grinding wheels that can save you money . . . and increase your production.

It's POSITIVE DUPLICATION— offered *only* by CINCINNATI (PD)° Grinding Wheels.

Through the CINCINNATI (PD) Manufacturing Process you are assured Positive Duplication of the original wheel *every* time you reorder. "On grade" with a CINCINNATI (PD) WHEEL means all future (PD) WHEELS will act and grind exactly alike.

Yet CINCINNATI (PD) WHEELS *are priced no higher than ordinary wheels.*

So, if you don't have an elephant's memory, make a pencil note to contact your CINCINNATI Grinding Wheels distributor. Or, contact us direct and we'll send one of our representatives—men who know grinding and grinding machines as well as grinding wheels. Write, wire or telephone Sales Manager, Cincinnati Milling Products Division, Cincinnati 9, Ohio.

And don't forget this—*only* CINCINNATI Grinding Wheels give you . . .

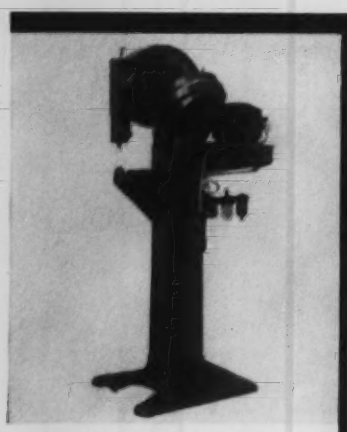
(PD) POSITIVE DUPLICATION

A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.

°Trade Mark Reg. U. S. Pat. Off.

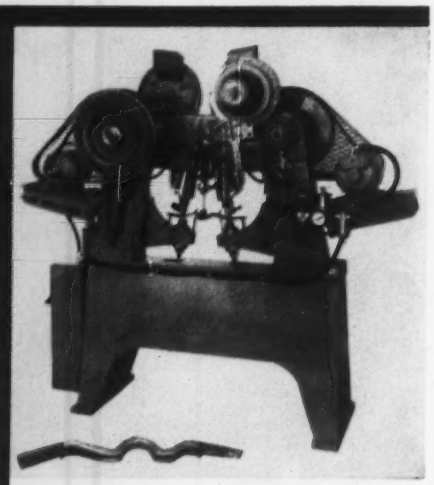
CINCINNATI°
Grinding Wheels

T-J does your riveting and clinching Faster... Automatically!



T-J Clinchors adaptable to a wide range of clinch nut setting problems. Gravity feed model shown here.

CLINCHORS



This T-J Special Dual Rivitor sets two rivets at a time . . . consists of two 8" throat Model R Rivitors, each with 10" hopper, special oversize anvil post, and special horn. Sample of work shown below machine.

RIVITORS

Automatic feeding and setting with T-J Rivitors and Clinchors help you reduce labor and step up SPEED in a wide range of assembly jobs for aircraft, automotive, farm machinery, stampings of all kinds.

T-J CLINCHORS set clinch nuts with fully automatic operation, controlled by a single foot pedal. Available in Underfeed and Gravity feed models, throat depths 8" to 36".

T-J RIVITORS automatically feed and set solid rivets with high production. Electrically powered Rivitor sets solid steel rivets up to ⅞" long. Air-powered sets aluminum alloy rivets or steel rivets up to ¾" long. Throat depths 8" to 36".

Write for Clinchor bulletin 555; Rivitor bulletins 646 and 555. The Tomkins-Johnson Co., Jackson, Mich.

T-J TOMKINS-JOHNSON
RIVITORS AIR AND HYDRAULIC CYLINDERS CUTTERS CLINCHORS

39 Years Experience

LETTERS

(Concluded from page 10)

saving program recently installed in the Bureau of Ships for the purpose of obtaining a maximum functional product at a minimum cost. We are interested in new products, new processes and literature that may be used to help us find less costly materials and still maintain quality.

Value engineering is the Navy's counterpart of industry's value analysis.

Edward A. Foehl
Head-Value Engineering Branch
Philadelphia Naval Shipyard
Naval Base
Philadelphia

Study Fits Situation

We have read with interest your article, "Wage Differential Maze: Where's Escape?" (Oct. 22, page 45). It fits our situation so exactly that we would appreciate receiving 20 copies.

J. W. Jolly
General Manager
Standard Tube & T.I. Ltd.
Woodstock
Ontario, Canada

Please send a copy. Many thanks —and keep up the good work.

Fred C. King
President
King Bros. Inc.
Portland, Oreg.

Copies to Key Executives

We would like 20 reprints of the article, "Motivating Men To Produce More" (Sept. 24, page 105). It is an exceptionally thorough and well-written presentation of this most important problem facing progressive management.

We would like to furnish these copies to our key executives. We believe it would prove stimulating and challenging.

Norris Aldeen
Vice President-Manufacturing
Amerock Corp.
Rockford, Ill.

Glad To Help Uncle Sam

During a brief visit to the Machinery & Equipment Division of the BDSA branch of the Commerce department the other day, I saw a copy of STEEL which contained an account of the steel expansion program. It was an instructive and interesting piece of work and quite useful. I would welcome a reprint.

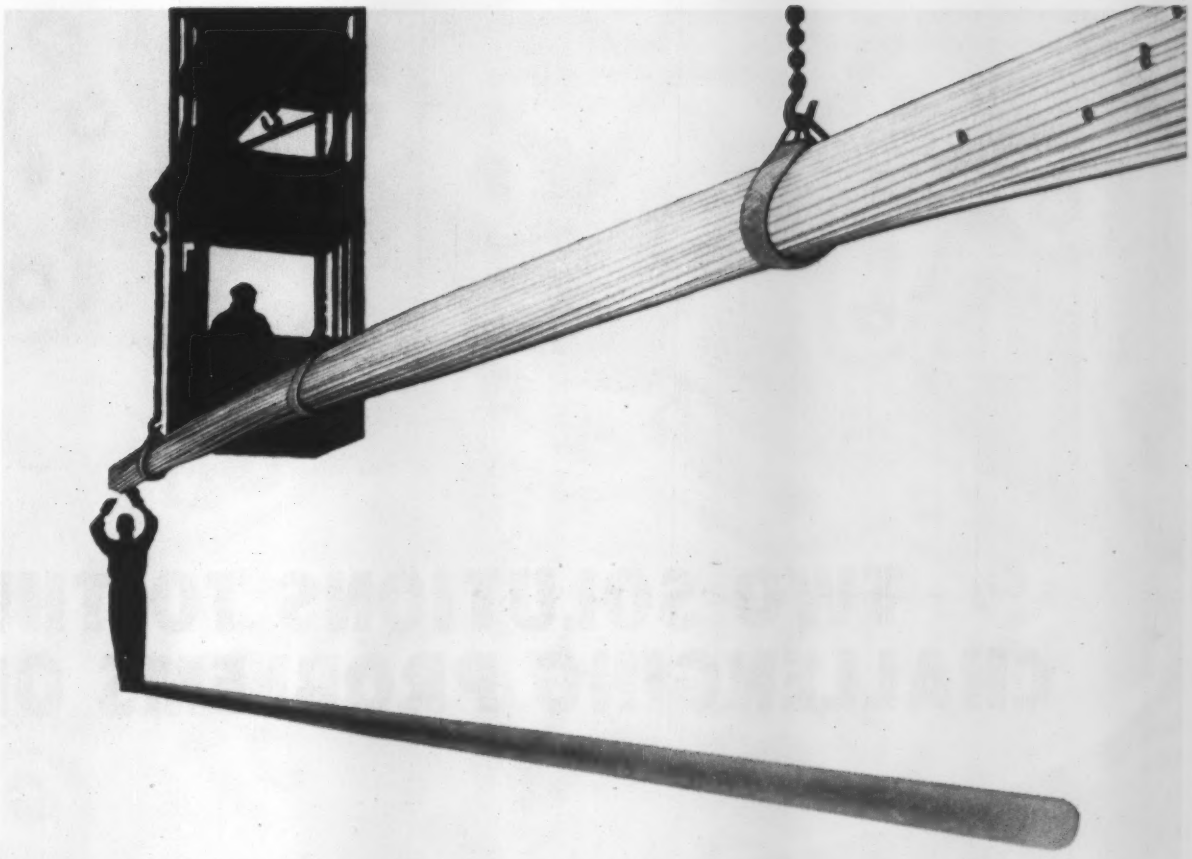
I am acting as a consultant to the Machinery & Equipment Division, advising in the making of a survey of rolling mill machinery and equipment builders for mobilization purposes.

I was with United Engineering & Foundry Co. for 25 years until I retired last year. During those 25 years, I traveled around this old world, so you can guess that I have seen many changes during my 65 years in the mills and in engineering.

In my 79th year, I am helping Uncle Sam and glad of it.

Joe Malborn
4614 Fifth Avenue
Pittsburgh

• *A reprint of the article, "Steel Expansion Rolls Along" (Sept. 17, page 134) is being forwarded.*



Here is the answer to your needs for **EXTRA LONG**

SEAMLESS STEEL TUBING

Pacific Tube Company can now supply you with precision, cold-drawn Seamless Steel Tubing in absolutely straight lengths up to 58 feet long. Special new equipment, including new pickling tanks 60 feet long makes this feat possible. The longest draw bench in the country helps, too!

For your protection and better tubing, new high-pressure hydrostatic testing is used.

A wide range of sizes is quickly available in many chemistries in Stainless, Seamless Carbon and Alloy Tubing... cold-drawn to your exact specifications.

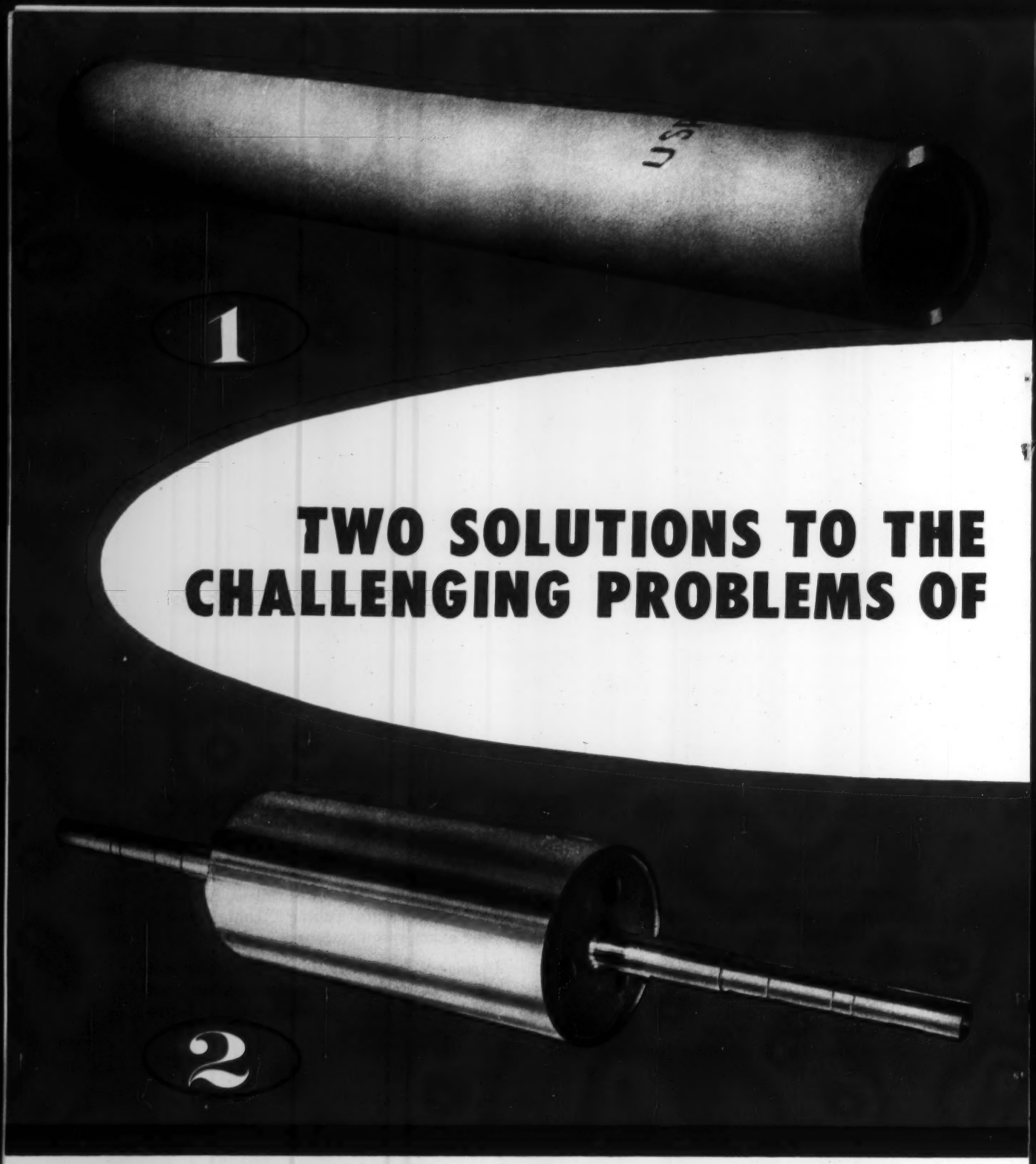
If you are faced with an application or metallurgical problem, our engineering staff can be of valuable assistance... just let us know your problem.

Pacific also manufactures...
COLD-DRAWN BARS
GROUND & POLISHED SHAFTING
Precision drawn to rigid specifications from 3/16" thru 3½" in many chemistries including Ledloy Grades A & B.

Pacific
TUBE COMPANY

5710 Smithway St., Los Angeles 22, Cal.

MANUFACTURERS OF SEAMLESS STEEL TUBES • BAR STOCK • GROUND & POLISHED SHAFTING



TWO SOLUTIONS TO THE CHALLENGING PROBLEMS OF

UNITED STATES PIPE & FOUNDRY CO.

Steel and Tubes Division

STEEL & TUBES U.S. PIPE DIVISION

BURLINGTON, NEW JERSEY

SALES OFFICES: LOS ANGELES, SAN FRANCISCO, CHICAGO, ST. LOUIS, COLUMBUS, DETROIT, PITTSBURGH, HARTFORD, BURLINGTON

HIGH TEMPERATURE

SOUNDNESS AT 2150° F.

1 Because of their inherent soundness, metal mold centrifugally cast retorts give longer operating life at extreme temperatures. These retorts have been tested in service under the most adverse operating conditions, and field performance data prove their superiority conclusively.

Centrifugally cast stainless steel retorts are used by the New England Lime Company of Canaan, Connecticut to produce high purity magnesium metal by thermal reduction. Their retorts are operated 24 hours a day at 2150° F. under a high internal vacuum — a test only the ultimate in soundness and quality could survive.

SURFACE AT 1400° F.

2 The Selas Corporation of America, one of the nation's leading industrial furnace builders, demands a high order of quality in the stainless steel rolls used in their continuous strip annealing furnaces. Perfect roll surfaces are a "must". The slightest surface imperfection in the strip will cause rejection.

Long, trouble-free life, at extreme temperatures, is assured because of the dense, flawless roll surface made possible by the metal mold centrifugal process.

In cylindrically shaped sections, U. S. Pipe offers a wide range of sizes in electric furnace alloys for many difficult and exacting applications.

"METAL MOLD" CENTRIFUGAL CASTINGS

SIZE RANGE AND COMPOSITION FLEXIBILITY

Outside Diameter	5" to 50"
Wall Thickness	⅜" and up
Length	Up to 16'
Type of Stainless Cast	All Standard AISI and ACI grades of ferritic and austenitic stainless plus "Special" types

STAINLESS and ALLOY SCRAP

Whether it's MIXED—CLEAN or OFF-GRADE — All lots.

CONSTANT BUYERS OF . . . STAINLESS STEEL HIGH SPEED STEEL • CHROME STEEL • MONEL INCONEL • NICHROME • STELLITE • HASTELLOY • NICKEL • CUPRO NICKEL • TUNGSTEN AIR CRAFT BREAKAGE • COMPOSITION MATERIAL • COBALT ALLOYS • ANODES • RESIDUES

MODERN YARD AND PLANT FACILITIES LOCATED ON B&O CT RR

PHONE • WIRE • WRITE PRospect 8-4466

alloys & metal Specialties, Inc.

6901 SOUTH BELL AVE. CHICAGO 36, ILL.

UNIT MACHINING COST CUT 17% ON THIS GRAY IRON CASTING

...thanks to

FERROCARBO®

Users everywhere report similar experiences. In fact, on 67 machining tests in 11 large machine shops, castings of gray iron treated with FERROCARBO averaged 89.5% greater machinability per tool than untreated castings. These premium castings are finer grained, denser, stronger, yet they COST YOU NO MORE . . . because your foundryman, using FERROCARBO, makes worthwhile savings in raw material costs.

FOR FREE BOOKLET on FERROCARBO, citing actual case histories of faster machining, with longer tool life, write The Carborundum Company, Dept. S2, Niagara Falls, N.Y. 64-52

CARBORUNDUM®

STEEL The Metalworking Weekly

Editor-in-Chief, IRWIN H. SUCH

Editor, WALTER J. CAMPBELL

Associate Managing Editors, VANCE BELL, JOHN S. MORGAN

WILLIAM M. ROONEY	*Market Editor*	ALLEN G. GRAY	*Technical Editor*
J. D. KNOX	*Steel Plant Editor*	ROBERT F. HUBER	*Machine Tool Editor*
	HARRY CHANDLER *Copy Editor*		
FRANK R. BRIGGS	*Associate Editor*	VAN CALDWELL	*Associate Editor*
	ROBERT O. JAYNES *Associate Editor*		
AUSTIN E. BRANT	*Assistant Editor*	GLENN W. DIETRICH	*Assistant Editor*
BYRON E. KENNEL	*Assistant Editor*	MARY T. BORGERHOFF	*Assistant Editor*
ROSS WHITEHEAD	*Assistant Editor*	MARY ALICE LYMAN	*Assistant Editor*
JOHN R. BOTZUM	*Assistant Editor*	EILEEN CORTES	*Assistant Editor*
MARY ANN STUVE	*Editorial Assistant*	JANE WEDGE	*Editorial Assistant*
	BETTY ZAYAC *Editorial Assistant*		
	THOMAS H. BRYAN, TOM WELSH, *Art Editors*		
	IRENE KASNER *Editorial Service*		

Resident Editors

New York 17 — 60 E. 42nd St. — B. K. PRICE, L. E. BROWNE, STANLEY B. STEWART — Murray Hill 2-2581

Chicago 11 — 520 N. Michigan Ave. — ERLE F. ROSS, WILLIAM E. DEAN — Whitehall 4-1234

Pittsburgh 19 — 2837 Koppers Bldg. — ROBERT M. LOVE — Atlantic 1-3211

Detroit 35 — 15800 W. McNichols Rd. — A. DONALD POSTMA — Broadway 3-8150

Washington 4 — 1123 National Press Bldg. — JAMES P. MORRISSEY — Executive 3-6849

London, 2 Caxton St., Westminster S. W. 1 — VINCENT DELPORT — *European Editor*

Editorial Correspondents

Birmingham	R. W. KINCEY, Birmingham 3-1121	Seattle	R. C. HILL, Melrose 1895
Buffalo	GEORGE E. TOLES, Emerson 5385	Cincinnati	DICK HAVLIN, Beechmont 1-9607
St. Louis	HAMILTON THORNTON, Jackson 1-9281	Toronto, Canada	F. S. TOBIN, Empire 4-9655
Youngstown	GEORGE R. REISS, Riverside 7-1471	Birmingham, England	J. A. HORTON
Los Angeles	NORMAN LYNN, Webster 5-3040	Paris, France	LEON JAUDOIN-PROM
San Francisco	EDWIN HAVERTY, Yukon 6-5151	Brussels, Belgium	PAUL DE KEYSER
		Dusseldorf, Germany	DR. HERBERT GROSS

BUSINESS STAFF

Advertising Director	H. G. ROWLAND	*Marketing Director*	D. C. KIEFER
Advertising Service Mgr.	DORIS MITCHELL	*Circ. & Research Dir.*	N. R. LADABOUCHE
Production Manager	A. V. ANDERSON	*Circulation Manager*	G. R. EBERSOLE
Promotion Director	S. F. MARINO	*Reprints*	JUNE SCHILENS
	Classified Advertising EVELYN DIETZ		

Advertising Representatives

New York 17 — 60 E. 42nd St. — K. A. ZOLLNER, GUY LABAW — Murray Hill 2-2581

Philadelphia — 200 Wynnewood Ave., Wynnewood, Pa. — WM. J. VERSCHOOR—Midway 2-6512

Farmington, Conn. — 12 Farmstead Lane — CALVIN FISHER JR.—Orchard 7-1756

Rochester, N. Y. — 217 Ridgeview Dr., East Rochester, N. Y. — HAROLD A. DENNIS—Browning 2105

Pittsburgh 19 — 2837 Koppers Bldg. — J. C. SULLIVAN—Atlantic 1-3211

Cleveland 13 — Penton Bldg. — J. K. GILLAM, N. W. MANNING — Main 1-8260

Cincinnati 6 — 2215 Victory Pkwy. — E. L. FRANKE—Parkway 1-0711

Detroit 35 — 15800 W. McNichols Rd. — C. A. TALLINGER JR.—Broadway 3-8150

Chicago 11 — 520 N. Michigan Ave. — L. C. PELOTT, W. L. POLAND, WM. J. D'ALEXANDER — Whitehall 4-1234

Los Angeles 48 — 5943 W. Colgate Ave. — F. J. FULLER—Webster 1-6865

San Francisco 4 — 57 Post St. — Robert W. Walker Co. — Sutter 1-5568

Griffin, Georgia — 1106 Pine Valley Rd. — FRED J. ALLEN—Griffin 7854

BPA

NBP

Published Every Monday by

THE PENTON PUBLISHING CO., Penton Bldg., Cleveland 13, O.

MAin 1-8260

GEORGE O. HAYS — *President*
RUSSELL C. JAENKE — *Executive Vice President*
FRANK G. STEINEBACH — *Vice President and Secretary*
FRANK O. RICE — *Vice President*
JOSEPH P. LIPKA — *Treasurer and Assistant Secretary*

Also Publisher of

FOUNDRY, MACHINE DESIGN, NEW EQUIPMENT DIGEST, AUTOMATION

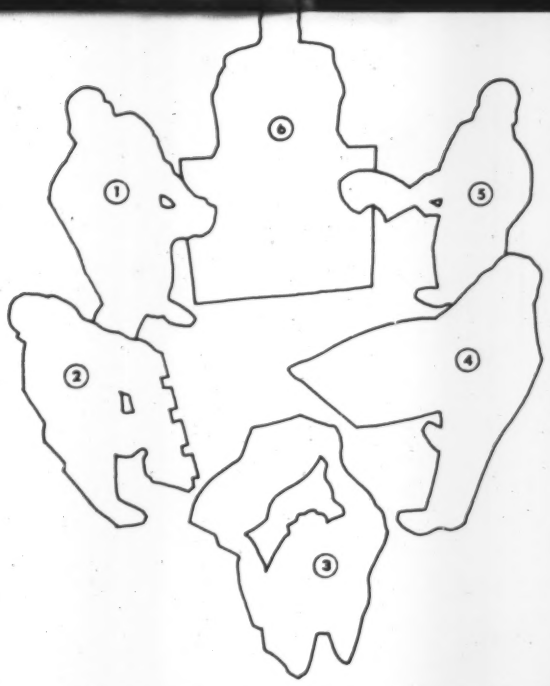
Member of Business Publications Audit of Circulation Inc., Society of Business Magazine Editors and National Business Publications Inc.

GRUELING DEMOLITION CONTEST FAILS TO FLAKE TI-CO!

STOCK CAR DRIVER inspects sheet of Ti-Co after battering in demolition race. No trace of coating failure could be found.

The brutal "demolition race" is one of the top crowd-pleasers in stock car racing. Each driver is bent on smashing his opponents out of the race . . . last car still moving is the winner! This grueling automotive mayhem at Chicago's Soldier Field provided the setting for an unusual demonstration of the toughness of the zinc coating on Inland Ti-Co galvanized sheets. A sheet of Ti-Co was lashed to the rear of one of the doomed jalopies. Car after car rammed it head-on, at speeds up to 50 m.p.h. After half an hour of constant crashing, battering punishment, the car was finally ready for the junk heap . . . but the zinc coating on the Ti-Co sheet had stayed put! Closest examination revealed not a trace of coating failure anywhere.

This test is, to be sure, rather unusual . . . but the Ti-Co coating has survived even tougher tests without cracking, flaking or peeling. Turn the page for more facts about how Ti-Co can cut your manufacturing costs, improve your products and add greatly to their useful life.



Shown (at the left) are six typical severe forming jobs now being accomplished with Inland Ti-Co: (1) deep-drawing, (2) roll-forming, (3) Pittsburgh lock-seaming, (4) spin-drawing, (5) crimping, (6) perforating.

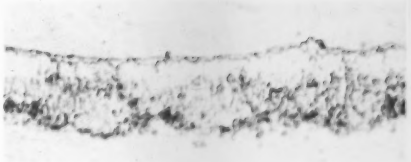
INLAND TI-CO GALVANIZED SHEETS TAKE THE TOUGHEST FORMING OPERATIONS IN STRIDE

Any product that can be formed with steel can be formed with Inland Ti-Co. Ti-Co's ability to withstand even the most severe forming without cracking of the zinc coating makes possible many new galvanized steel products.

The zinc coating on Ti-Co is not only extemely tough but has just enough pliability to actually flow with the base metal as it's formed. Both on the production line and in extended usage, the Ti-Co coating has proved its ability to withstand punishment without leaving the slightest opening for rust to get a foothold. Unlike the conventional galvanized, products made from Ti-Co do not require re-dipping or "touch-ups" after fabricating, and rejects are greatly minimized. Ti-Co products can be depended upon for long service.

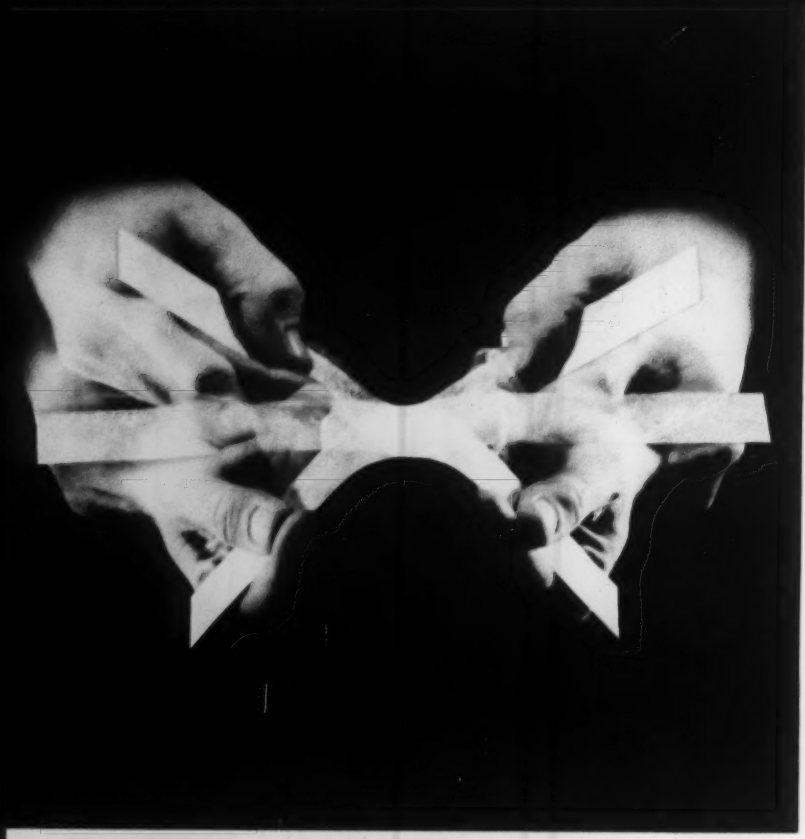
THE SECRET OF INLAND'S NON-FLAKING TI-CO

Inland Ti-Co galvanized steel is made by the patented Sendzimir process, a continuous operation in which the heat treatment of the strip and the application of the zinc coating are performed in one continuous galvanizing line. This process eliminates the brittle iron-zinc alloy layer, that causes flaking in conventional galvanized sheets, and results in production of a sheet on which the zinc adheres so tightly that it can be severely formed without flaking of the coating.



Photomicrograph reveals hard, brittle iron-zinc alloy layers which cause flaking in conventional galvanized steel.

Alloy layers are virtually eliminated in galvanized sheets made by the Ti-Co continuous process of galvanizing.



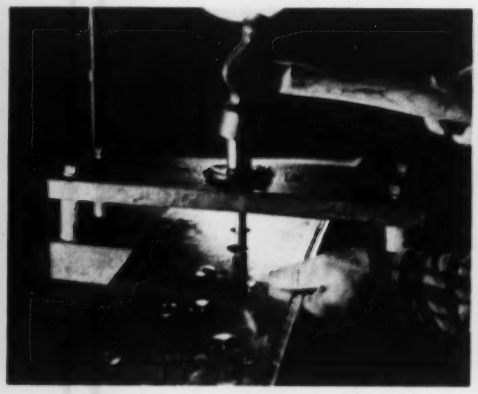
WHY YOU CAN BE SURE OF TI-CO'S QUALITY

Samples from every order of Ti-Co are put through a series of tests far more severe than ever demanded of a galvanized sheet in normal fabrication.

In addition to the coating tests shown below, the Ti-Co quality control routine includes the following tests: Olson Cup test for ductility; Rockwell Hardness test; Weight for Coating test for uniformity; Fluting test of resistance to cross-breaking; Microstructure test for tightness of coating.

HOW YOU CAN TEST TI-CO. Take a piece of the galvanized steel you are now using and bend it back and forward on itself several times. If the coating flakes or peels, it's *not* Ti-Co. For a free sample of Ti-Co to use in making your own "bend test" comparison, please write to Department 297.

LOCK SEAM TEST. The tough 180° bend of a Pittsburgh lock seam is a supreme test of fabricating qualities. Ti-Co takes it!



IMPACT TEST. Rounded punch hammered into Ti-Co sheet dents the steel. But the Ti-Co coating "gives" without cracking.

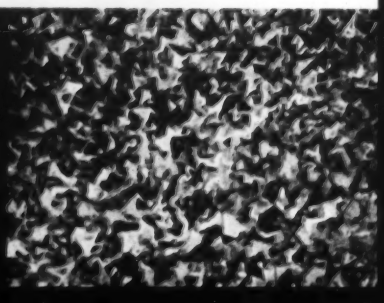
BEND TEST. Hammered flat to a 180° bend, the Ti-Co coating shows no sign of cracking or flaking after repeated pounding.

INLAND STEEL COMPANY

38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Paul • Davenport
St. Louis • Kansas City • Indianapolis • Detroit • New York

INLAND
TI-CO
®



When one welder gives both AC and DC...

Handles every type of electrode...

Yet costs less to buy and operate...

WHY

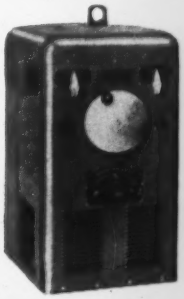
shouldn't you be using IDEALARCS for your production welding?

Certain electrodes work best on... AC

Other electrodes operate better on... DC

Some rods that work best on DC in smaller sizes... DC

work best on AC on the larger sizes. AC



IDEALARC

with its instant selection of AC or DC gives optimum performance *on every type and size electrode.*

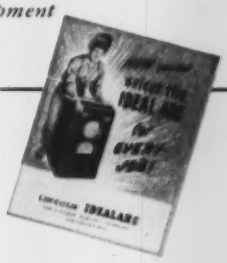
There's no other welder like Idealarc.

THE LINCOLN ELECTRIC COMPANY

Cleveland 17, Ohio

The World's Largest Manufacturer of Arc Welding Equipment

© 1956 The Lincoln Electric Company



THE LINCOLN ELECTRIC COMPANY
Dept. 1623, Cleveland 17, Ohio

☐ Send me Bulletin 1343 on Idealarc.
☐ Have representative call.

Name_____

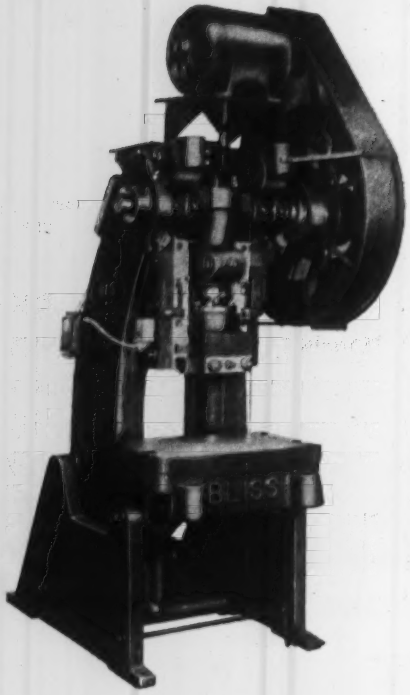
Position_____

Company_____

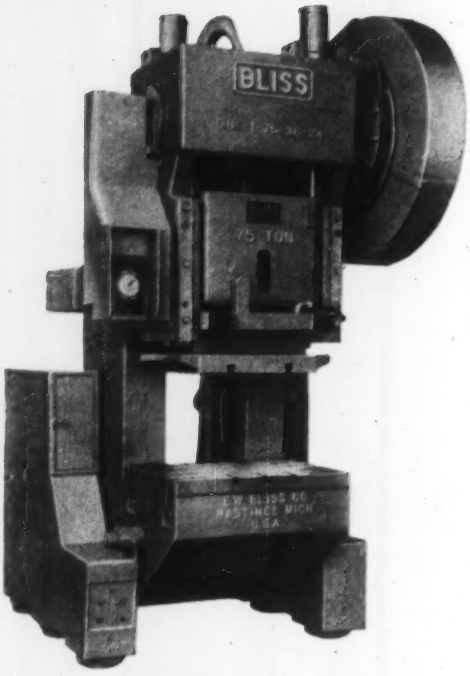
Address_____

City_____ State_____

Bliss inclinables offer you a wider



Standard Inclinable Presses—as furnished in the 10 to 125 ton range. No. 21-S press, 45 ton capacity, shown here.



Enclosed Inclinable Presses—75 to 200 tons. A 75-ton capacity model is shown here.

More standard types Bliss builds *23* standard inclinables—open-back inclinables, JIC inclinables, hydraulic inclinables, double-crank inclinables . . . offers a wider range of capacities and bed areas than any other make.

More standard clutches The Bliss Positive rolling key clutch and a choice of Bliss crankshaft or driveshaft mounted air friction clutches have been proved on thousands of presses. Bliss has the type of clutch best suited to your work.

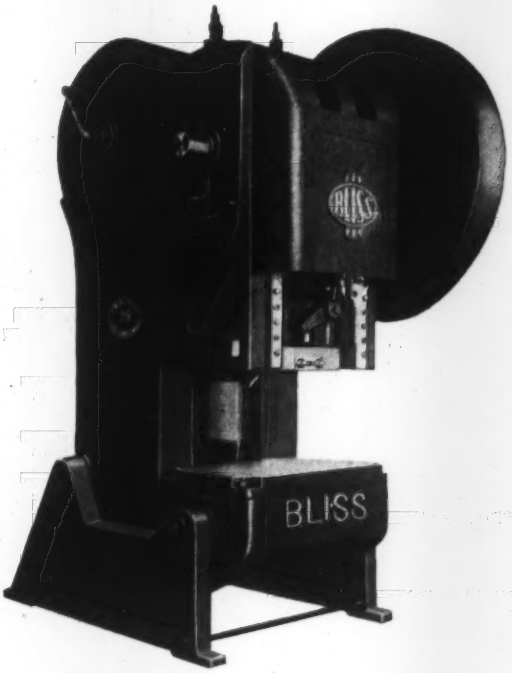
More standard feeds Bliss designs and manufactures its *own* line of roll and dial feeds. This single responsibility for both presses and feeds is the press user's assurance that feeds are easily installed and easily adjusted.

More standard cushions Five different types of cushions, in a range of sizes that meet every need, make any Bliss inclinable a double-action press. Cushions are especially designed for the press, and the presses designed to receive them—either assembled to press before shipment or easily installed years later.

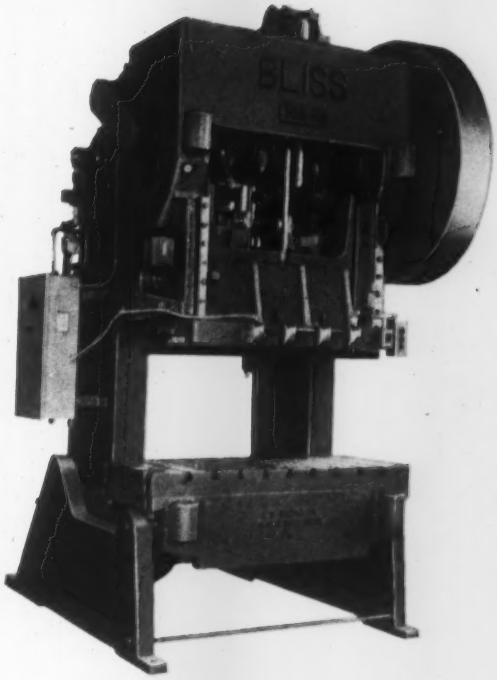
. . . And a million dollar parts and service program to protect your investment!

Because Bliss *mass-produces* its inclinables, maintaining a stock-pile of spare parts is a simple matter. The million-dollar inventory of spare parts of Bliss' inclinable plant is by far the largest in the industry and includes clutch plates and parts, shafts, gears, pinions and the like. Moreover, Bliss maintains a separate, specially-trained organization whose sole purpose is to service your spare parts needs as quickly as possible.

choice of standard types and sizes



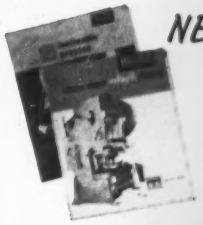
Standard Enclosed Inclinable as furnished in 150 and 200 ton sizes. No. 29, 150-ton capacity, is shown above.



Double-crank Inclinable Presses—from 18 to 175 tons. No. 108, of 100 tons capacity, is shown here.

A few of the reasons why BLISS inclinables outsell all other makes ... *and always have*

- Cast Meehanite frame—stronger, tougher. Fine grain structure dampens noise and vibration.
- Clutches—whose design has been proved by the thousands now in use.
- Gibs are close fitting, extra long, and insure accurate slide alignment at all points in the stroke. Simple to adjust so that original accuracy can always be maintained.
- Choice of hand, semi-automatic or automatic lubrication.



NEW catalogs now available

32 pages—describes frames, feeds, clutches, cushions and complete line of open back and enclosed single-crank inclinable presses. Gives dimensions and specifications. Catalog No. 2-D.

12 pages—describes these versatile extra-width double-crank presses. Gives dimensions and specifications for entire line. Catalog No. 3.

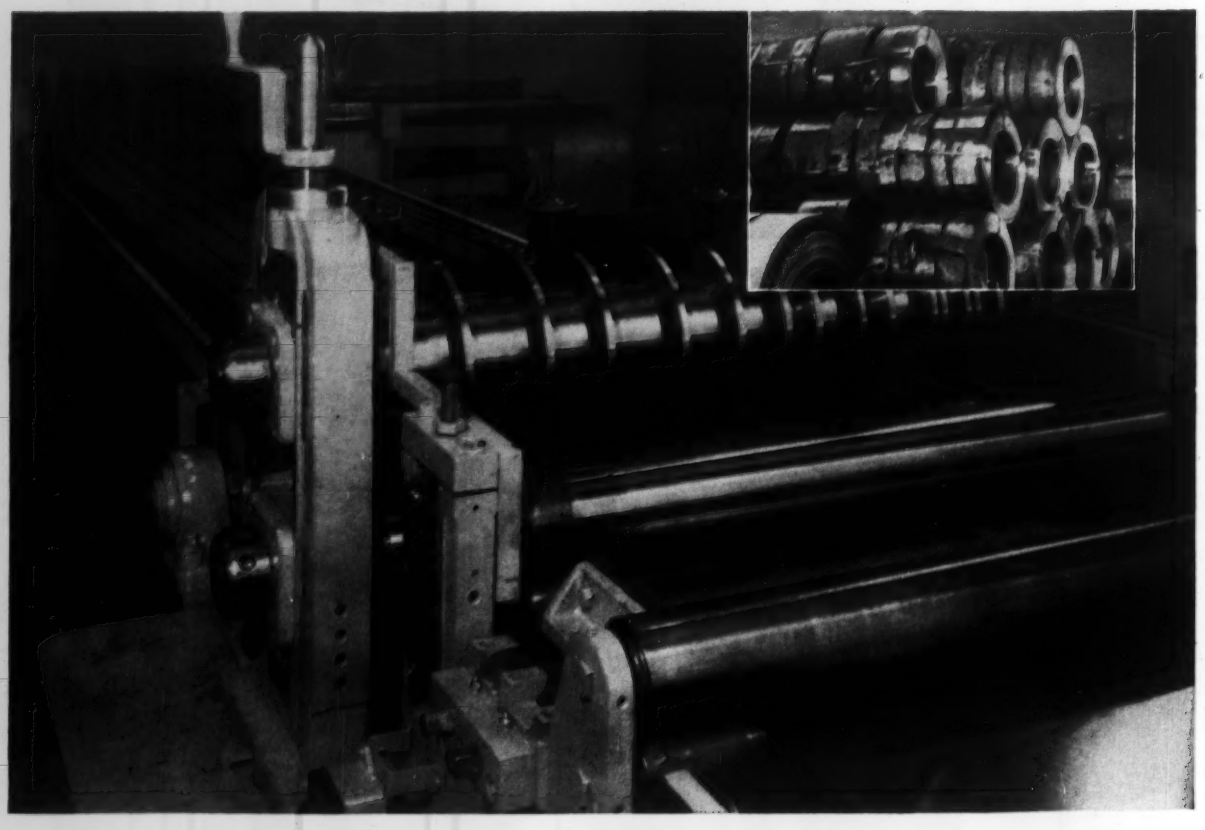
BLISS
SINCE 1857

BLISS is more than a name ... it's a guarantee!

E. W. BLISS COMPANY, Canton, Ohio

Presses, Rolling Mills, Special Machinery

U. S. Plants in Canton, Cleveland, Salem and Toledo, Ohio; Detroit and Hastings, Michigan; San Jose, California; Midland and Pittsburgh, Pa. *Branch offices in* Burbank, Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Pittsburgh, Philadelphia, Rochester, Salem, San Jose, Toledo, Washington, D. C.; and Toronto, Canada; E. W. Bliss (England) Ltd., Derby; E. W. Bliss Co. (Paris), France. *Other representatives throughout the world.*



. . . these things and others, too, a Yoder Slitter can do for you...

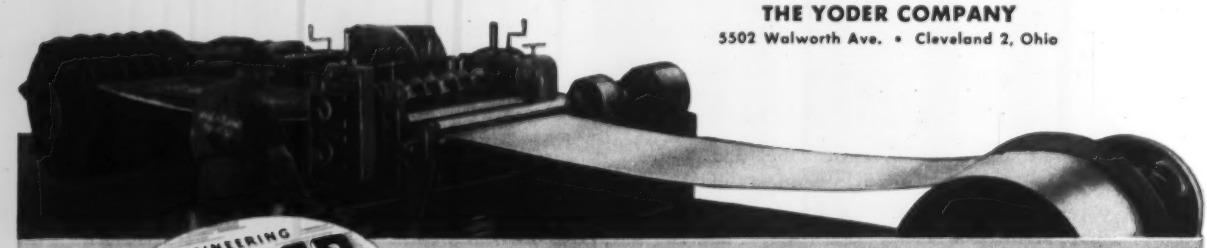
By doing your own slitting, you may easily save $12,000 or more per year in slitting cost alone, on requirements as low as 100 tons per month.

But don't make the mistake of thinking this is the only saving or advantage enjoyed. Many owners realize equally important savings by being able to buy standard width coils competitively, from more numerous sources of supply—wherever they can get the best price and quality. Much quicker deliveries are also obtainable in this way.

Inventory requirements, too, are greatly reduced and production planning simplified because, from a relatively small stock of mill-width coils or sheets, you can meet expected and unexpected needs for slit strands in a few hours.

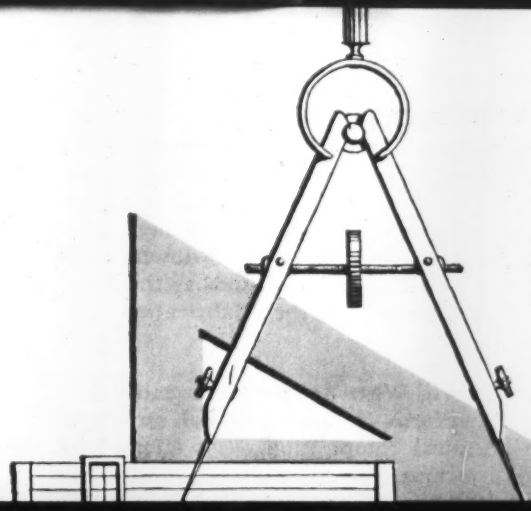
Send for the Yoder Slitter Book—a comprehensive text on the mechanics and economics of slitters and slitting line operation, with time studies, cost analyses and other valuable data. It's yours for the asking.

THE YODER COMPANY
5502 Walworth Ave. • Cleveland 2, Ohio

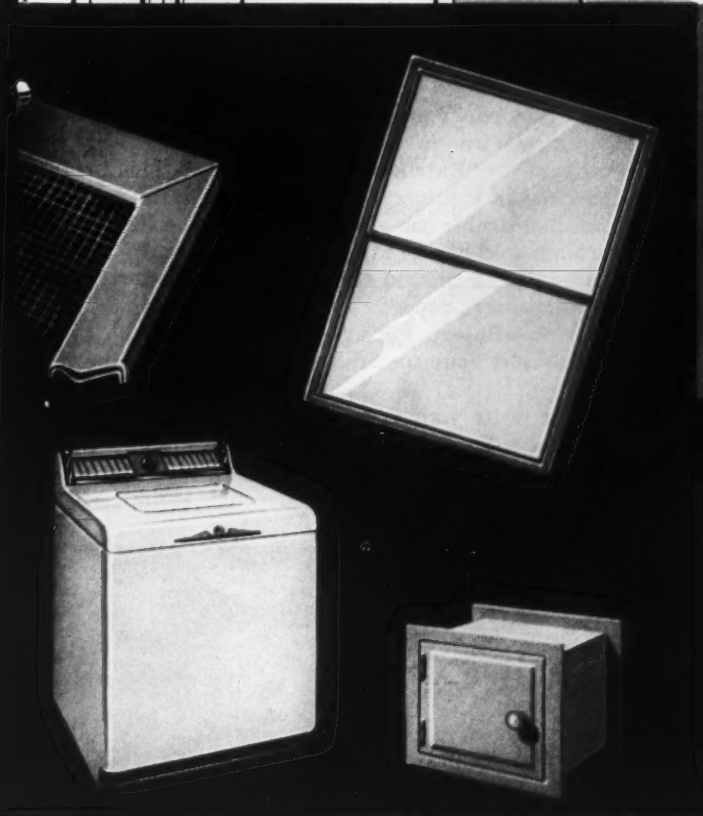


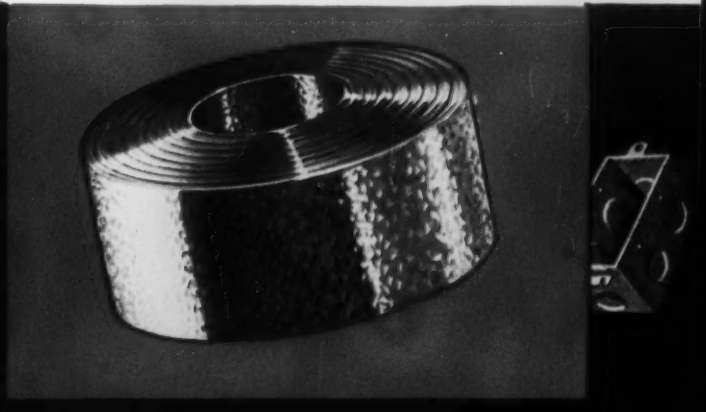
ENGINEERING YODER MANUFACTURING

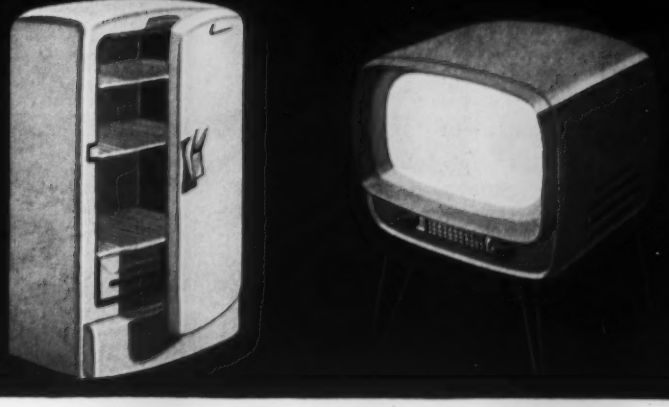
ROTARY SLITTING LINES
COLD ROLL FORMING MACHINES
ELECTRIC-WELD PIPE AND TUBE MILLS



put these bonus advantages of WEIRKOTE galvanized steel to work for you!







For appliances, for other steel products . . . when the job calls for galvanized steel, Weirkote does that job *better*.

Weirkote is made by a special continuous galvanizing process . . . and a tight zinc coating is applied. Result: Weirkote is resistant to peeling, cracking and flaking, even under the severest stresses of fabrication. The coating stays uniform, flows evenly with the base metal, and holds fast under the deepest draws. Amazingly corrosion-resistant, too!

These are just a few of Weirkote's *bonuses* in durability, economy, customer satisfaction. Make it a point to investigate Weirkote from Weirton! Remember: *In the long run, galvanized steel . . . in the LONGER run, WEIRKOTE.*

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION

Youngstown "cold heading quality" wire and rods

. . . provide high fastener production at National Screw & Manufacturing Co.

CLEVELAND'S National Screw & Manufacturing Company is widely known for the quality and dependability of their complete line of fasteners. To maintain continuous product quality and provide high production, they rely on Youngstown Cold Heading Quality Wire and Rods as the basic material for many of their fabrication processes.

Youngstown Wire & Rods are internally sound, uniform in both physical structure and chemical composition—as well as free from injurious seams and slivers. That's because they are quality controlled through all Youngstown's integrated operations from ore mining to finish product.

Furthermore, Youngstown's Cold Heading Quality Wire is supplied with a tight "Nogald" or "Extrudo" coating that provides the necessary lubrication to prevent galling and undesirable die wear. It feeds smoothly through cold headers giving steady high production right around the clock. No wonder satisfied users report: "Our production's increasing—Rejects falling—Profits up." Why not make it your specification?

Call or write your nearest Youngstown District Sales Office for additional information on metallurgical assistance.

THIS MODERN SOLID DIE DOUBLE LONG-STROKE COLD HEADING MACHINE AT NATIONAL SCREW PRODUCES HIGH CARBON HEX-HEAD CAP SCREWS UP TO ½ INCH DIAMETER, BY 6 INCHES LONG WITH ONLY TWO STROKES OF ITS HAMMER. USING 2800 POUNDS OF WIRE IT DELIVERS APPROXIMATELY 4900 PIECES PER HOUR

QUALITY YOUNGSTOWN SERVICE

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel

General Offices - Youngstown 1, Ohio

District Sales Offices in Principal Cities

CALENDAR
OF MEETINGS

Nov. 12-14, National Electrical Manufacturers Association: Annual meeting and convention, Traymore hotel, Atlantic City, N. J. Association's address: 155 East 44th St., New York 17, N. Y. Managing director: Joseph F. Miller.

Nov. 14-15, Building Research Institute: Research correlation conference on windows and glass in exterior of buildings, U.S. Chamber of Commerce, Washington. Institute's address: 2101 Constitution Ave., Washington 25, D.C. Executive director: William H. Scheick.

Nov. 25-30, American Society of Mechanical Engineers: Annual meeting, Hotel Statler, New York. Society's address: 29 W. 39th St., New York 18, N.Y. Secretary: C. E. Davies.

Nov. 26-27, Wire Reinforcement Institute Inc.: Fall meeting, Jung hotel, New Orleans. Institute's address: National Press Bldg., Washington 4, D.C. Managing director: Frank B. Brown.

Nov. 26-30, American Society of Mechanical Engineers: 22nd National Exposition of Power & Mechanical Engineering, Coliseum, New York. Information: International Exposition Co., 480 Lexington Ave., New York 17, N.Y. Exposition manager: E. K. Stevens.

Nov. 26-30, National Institute of Management Inc.: Production control and inventory management program, Alcazar hotel, Cleveland Heights, O. Institute's address: 1008 National City Bank Bldg., Cleveland 14, O. Managing director: Nyles V. Reinfeld.

Nov. 27-30, National Chemical Exposition, Public Auditorium, Cleveland. Information: American Chemical Society, Chicago Section, 86 E. Randolph St., Chicago 1, Ill.

Nov. 28-30, National Industrial Conference Board Inc.: Atomic energy conference, Waldorf-Astoria, New York. Board's address: 460 Park Ave., New York 22, N.Y. Secretary: Herbert S. Briggs.

Dec. 3-6, National Institute of Management Inc.: Program on work simplification for supervisors, Alcazar hotel, Cleveland Heights, O. Institute's address: 1008 National City Bank Bldg., Cleveland 14, O. Managing director: Nyles V. Reinfeld.

Dec. 5-7, National Association of Manufacturers: Annual meeting and exhibit, Waldorf-Astoria, New York. Association's address: 2 E. 48th St., New York 17, N.Y. Secretary: Thomas M. Brennan.

Dec. 5-7, American Institute of Mining, Metallurgical & Petroleum Engineers Inc.: Electric furnace steel conference, Morrison hotel, Chicago. Institute's address: 29 W. 39th St., New York 18, N.Y. Secretary: Ernest Kirkendall.

Dec. 6-7, Illinois Institute of Technology: Cost control conference, IIT Commons Bldg., 3200 S. Wabash Ave., Chicago. Institute's address: 35 W. 33rd St., Chicago 16, Ill. Manager of public relations: Victor J. Danilov.

Dec. 9-12, American Institute of Chemical Engineers: Annual meeting, Hotel Statler, Boston. Institute's address: 120 E. 41st St., New York 17, N. Y. Secretary: F. J. Van Antwerpen.

Dec. 10-11, Material Handling Institute Inc.: Annual meeting, Biltmore hotel, New York. Institute's address: One Gateway Center, Pittsburgh 22, Pa. Managing director: R. Kennedy Hanson.

For the message that sticks use

Behr-cat® PRINTABLE TAPE!

You'll find Behr-cat No. 196 Printable Flatback Tape perfect for packaging, marking, labeling, identifying or any of a dozen other printable tape applications. It's available in a variety of widths in both white and yellow . . . takes inks beautifully . . . unwinds smoothly . . . and offers fine, well-balanced tack. Put Behr-cat Printable Tape to the test on your next sealing or identifying operation. For further information write Behr-Manning Co., Troy, N. Y., Dept. S-11.

In Canada: Behr-Manning (Canada) Ltd., Brantford
For Export: Norton Behr-Manning Overseas Inc., New Rochelle, N. Y., U. S. A.

BEHR-MANNING CO.
a division of
NORTON COMPANY
NORTON ABRASIVES

BEHR MANNING PRODUCTS Coated Abrasives · Sharpening Stones · Behr-cat Tapes
NORTON PRODUCTS Abrasives · Grinding Wheels · Grinding Machines · Refractories

T-6

STEEL

Frogs and Florists

Florists keep flowers in place by sticking the stems into the sharp pins of a florist frog—sharp pins that are often made from hard drawn, low carbon CF&I-Wickwire Pin Wire which is free from scratches and other surface imperfections.

Chances are you don't need wire to make florist frogs. But *you may need one or more of the nearly 100 different categories of specialty wire for which CF&I-Wickwire is famous.* Let us show you how we can meet your most rigid chemical and physical specifications on high and low carbon wire in all sizes, shapes, tempers, finishes and grades.

Check This List!

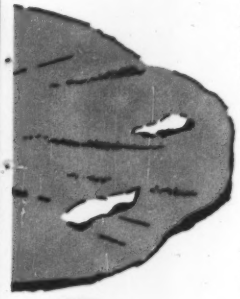
FOR THE WIRE YOU REQUIRE, SEE CF&I-WICKWIRE.

FLAT AND SHAPED WIRES
Armor Wire
Bobby Pin Wire
Bookbinder Wire
Brush Wire
Casing Wire
Cotter Pin Wire
Curtain Spring Wire
Die Spring Wire
Gutter Broom Wire
Lock Spring Steel
Rake Tine Steel
Regulator Spring Wire
Snake Fishing Steel
Stapling Wire for Preformed Staples (Flat)

LOW CARBON FINE AND SPECIALTY WIRE
Bee Wire
Bonnet Wire
Bookbinder Wire
Broom Wire
Clip Wire
Dent Spacer Wire
Drapery Pin Wire
Florist Wire
Fuse Wire
Glass Netting Wire
Hairpin Wire
Hook and Eye Wire
Mattress Wire
Picture Cord Wire
Picker Tooth Wire
Pin Ticket Wire
Pin Wire
Ring Traveller Wire
Spiral Binding Wire
Stapling Wire
Stapling Wire for Preformed Staples
Stone Wire
Weaving Wire
Weaving Wire for Fly Screen Cloth
Wissco Iron Wire

HIGH CARBON FINE AND SPECIALTY WIRE
Aircraft Cord Wire
Armor Wire
Belt Hook Wire
Bobbin Ring Wire
Brush Wire (Tempered and Untempered)
Brush Wire (High Strain)
Chrome Vanadium Spring Wire
Core Wire (Aluminum Cable Steel Reinforced)
Curtain Spring Wire
Flexible Shaft Wire
"Gamma" Spring Wire (Upholstery Spring Wire)
Zig Zag Wire
No-Sag Wire
Hat Wire
Heddle Wire
Hose Reinforcement Wire
Hose Wire, Mechanical
Hose Wire, Vacuum and Defroster
Rope Wire
Signal Corps Wire
Spoke Wire
Hard Drawn Spring Wire
Oil Tempered Wire
Spheroidized or Annealed Spring Wire
Tire Bead Wire
Valve Spring Wire

MANUFACTURERS LOW CARBON COARSE WIRE
Bag Tie Wire
Basket Handle Wire
Box Binding Wire
Brush Handle Wire
"Cal-Tie" Wire
Can Key Wire
Case Hardened Ball Wire
Chain Wire
Clamp Wire
Clothes Pin Wire
Concrete Wall Reinforcement Wire
Garment Hanger Wire
Hay Baling Wire (Coiled)
Lingo Wire
Lintel Wire
Loop Wire
Merchant Quality Wire
Pail Bail Wire
Rivet Wire
Stapling Wire
Strand Wire
Tying Wire
Welding Wire
Wissco Iron Wire
Industrial Quality Wire
Cold Rolling Quality Wire
Heading, Forging or Roll Threading Quality Wire
Medium High Carbon Wire



CF&I-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Casper Denver • El Paso • Ft. Worth • Houston • Kansas City • Lincoln (Neb.) • Oklahoma City • Phoenix Pueblo • Salt Lake City • Wichita • PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland San Francisco • Seattle • Spokane • WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo Chicago • Detroit • New Orleans • New York • Philadelphia • CF&I OFFICE IN CANADA: Toronto
CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

4242

"we go back to

(Above) Forming highway guard rails from 12 gage steel on Niagara 520 Ton Press Brake.

(Right) Piercing rails with same machine.

(Far Right) Forming chair seat frames for office furniture from 20 gage steel on Niagara 150 Ton Press Brake.

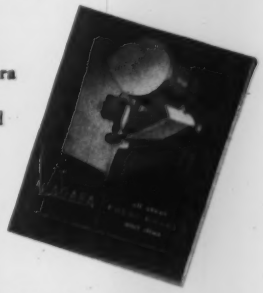
Niagara for Press Brakes"

"The personnel of our organization has been acquainted with Niagara equipment for years. Niagara will stand behind *any* equipment furnished. Many millions of operations in the past 5 years on their presses and press brakes... equipment satisfactory from both the operational and safety standpoint. Our intention is to use the Niagara line entirely."

There in the words of one customer (a large Ohio metal fabricator whose press brake operations are illustrated), you have the sentiments of hundreds. Once experienced with *any* of the other metalworking machines which Niagara makes... presses, shears, bending rolls and dozens more... one just naturally thinks first of Niagara whenever the subject of press brakes comes up.

REASONS ARE MANIFOLD: (1) Extreme helpfulness of Niagara's engineers in selecting the machine and accessories that will do the job best (no other manufacturer can offer so complete and large a line of sheet and plate metalworking equipment). (2) Unrivaled reputation and experience in the field, dating back 77 years, that assure unquestioned reliability. (3) World-wide recognition for design leadership, combining rock-bottom operating economy and top-notch performance in *every* product it makes (take a moment to run down this partial list of imposing press brake features):

- *Double end twin drive with double reduction gearing for smooth, uniform application of power at both ends of ram.*
- *Rugged, all-steel frames with box type crowns of unequaled strength and rigidity.*
- *Extra heavy, rigid bed and ram for maximum support of dies.*
- *Gearing totally enclosed in sealed oil baths for thorough, clean lubrication.*
- *Longer lasting, laminated, nonmetallic ways.*
- *Powerful, smooth-acting, multiple disc clutch and brake.*
- *Gibs maintain accurate, endwise alignment of ram.*



Standardized in a complete line, ranging from 50 through 775-ton capacities, Niagara Press Brakes are built to produce a tremendous variety of work uniformly and accurately. Post yourself now on all the details by requesting Bulletin 89 D and, as soon as you can, avail yourself of some really worthwhile suggestions from a Niagara representative. Write.

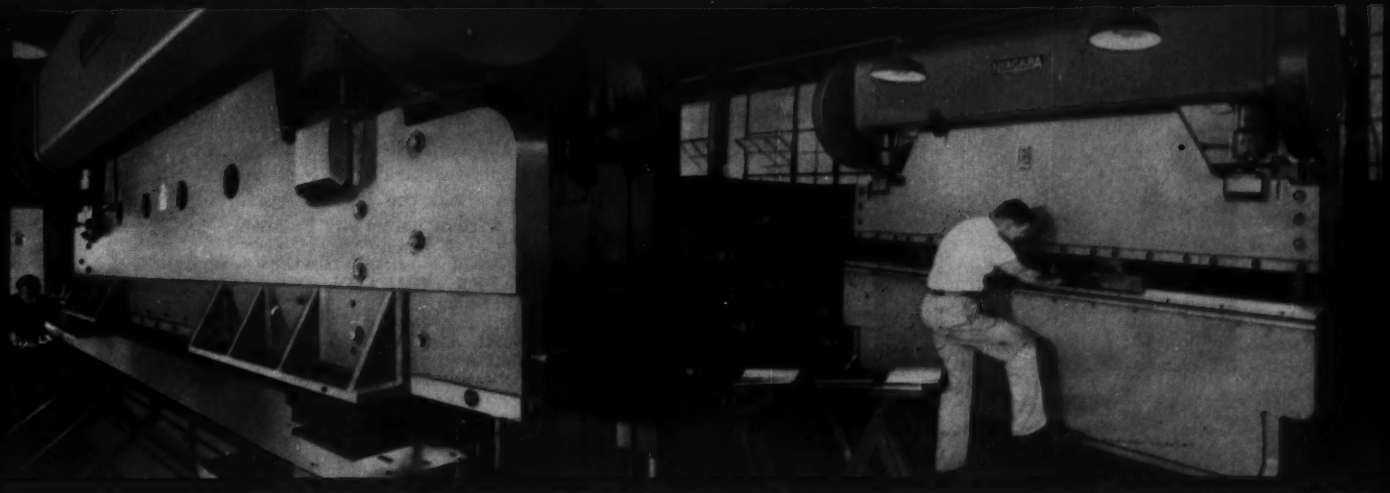
NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

DISTRICT OFFICES:

Buffalo • Cleveland • Detroit • Indianapolis • New York
Philadelphia

Distributors in principal U.S. cities and major foreign countries

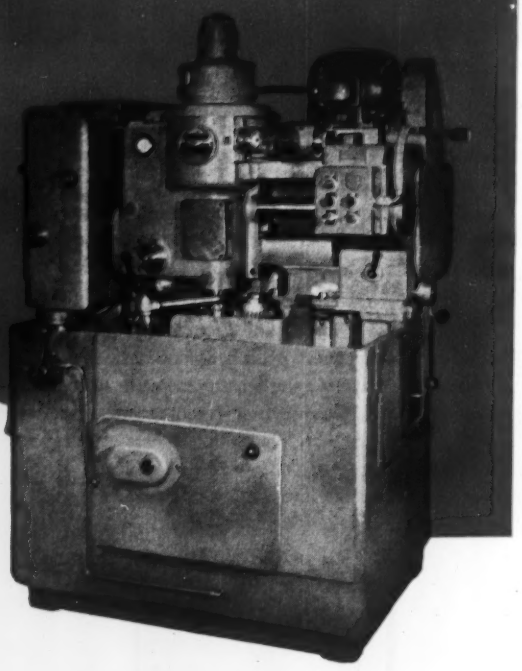
America's most complete line of presses, press brakes, shears, other machines and tools for plate and sheet metal work



NIAGARA PRESS BRAKES

fastest GEAR SHAPER EVER...

for gears up to 6" P.D.



FELLOWS
No. 4GS
GEAR SHAPER

No other machine combines such versatility with such speed and accuracy! Fellows' powerful No. 4GS Gear Shaper finish-cuts internal or external spur and helical gears up to 6" P.D., 2" face width . . . with nine cutter speeds from 98 to 635 strokes per minute available through stroke change gears!

At New Process Gear Company, for example, new Fellows No. 4GS Gear Shapers lowered production time 30% on the average, save set-up time by holding to 25% closer tolerances than other shapers.

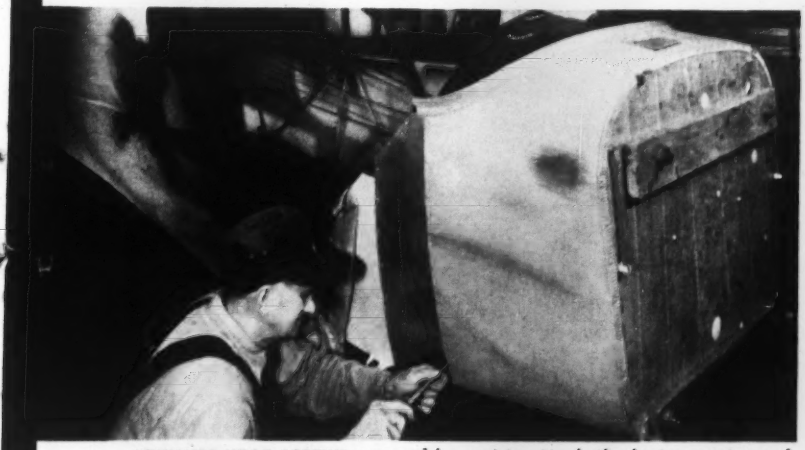
Easily adapted to semi-automatic or fully-automatic production for large runs, the 4GS is ideal too for cutting a nearly infinite variety of non-involute shapes and contours quickly and accurately. Set-ups and adjustments are simple and fast.

For full information about the No. 4GS Gear Shaper and the Fellows Precision Line, just ask your Fellows Representative. And ask him about the Fellows Plan for deferred payment. Write, wire or phone any Fellows office.

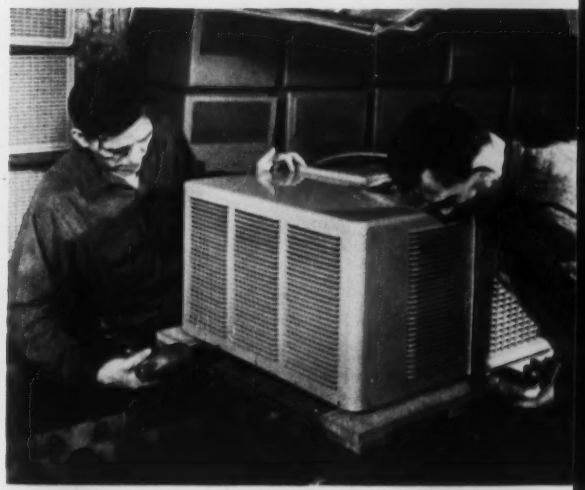
THE FELLOWS GEAR SHAPER COMPANY
78 River Street, Springfield, Vermont
Branch Offices: 319 Fisher Building, Detroit 2
5835 West North Avenue, Chicago 39
150 W. Pleasant Avenue, Maywood, N. J.
6214 W. Manchester Ave., Los Angeles 45

THE PRECISION LINE **Fellows** *Gear Production Equipment*

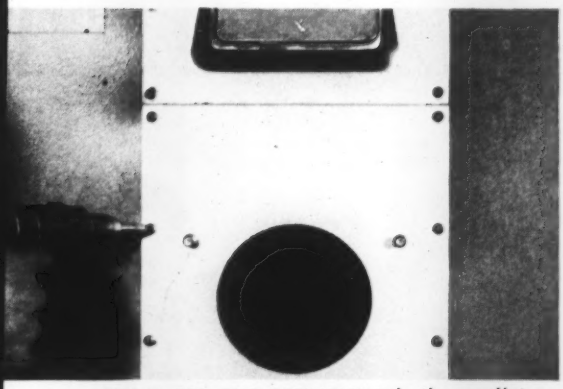
Neater, Better, Faster Assemblies with PHILLIPS CROSS RECESSED HEAD SCREWS



"PHILLIPS HEAD SCREWS are used in part to attach the instrument panel, inspection panels, compartment panels, wing tips, electrical panel and landing gear fastenings," says Mr. Counsil, a purchasing agent for the Piper Aircraft Corporation of Lock Haven, Pa. "In fact, it would be difficult to find any place in the plane where Phillips Head screws are not being applied."



"PHILLIPS HEAD SCREWS help us maintain highest quality and quantity," states Mr. W. E. Zielonka, plant manager of the Fedders-Quigan Corporation, Buffalo, N. Y., makers of famous Fedders room air conditioners and other products. Mr. Zielonka continues: "Our assembly line employees are the best salesmen for Phillips screws. They're paid by piece work, and fast, non-slip driving of screws means a lot."



"IDEAL FOR OUR OPERATION," is the verdict on Phillips screws at the Indianapolis plant of the Bryant Division of Carrier Corporation, world's largest producers of automatic heating units. "Phillips screws are terrific time savers, cause less waste and damage and give much tighter fit," reports Mr. Al Barnett, foreman of the Bryant general assembly department.

MANUFACTURERS OF PHILLIPS CROSS-RECESSED-HEAD SCREWS

THE FASTENERS OF TODAY...
AND OF THE FUTURE
X marks the spot
the mark of extra quality

Pledged to highest standards...

The Phillips Screw manufacturers listed here cooperate to turn out a uniformly high standard of quality. As sponsors of the Phillips Cross-Recessed-Head Standards Committee they adhere to the established dimensional standards, gauges, and gauging methods which will best serve industry.

Members of Screw Research Association

American Screw Company • Atlantic Screw Works, Inc. • The Blake & Johnson Co. • Central Screw Company • Continental Screw Co. Elco Tool and Screw Corporation • Great Lakes Screw Corp. • The H. M. Harper Company • The Lamson & Sessions Company • National Lock Company • The National Screw & Manufacturing Company • Parker-Kalon Division, General American Transportation Corporation Pheoll Manufacturing Co. • Scovill Manufacturing Company • Shakeproof Division Illinois Tool Works • The Southington Hdwe. Mfg. Company • Sterling Bolt Company • Universal Screw Company • Wales-Beech Corporation

Entering weight and dimensional data on control record at the press which forms refractory brick under high pressure. Representative control charts are shown above.

HARBISON-WALKER REFRACTORIES COMPANY

AND SUBSIDIARIES

World's Most Complete Refractories Service

General Offices: **PITTSBURGH 22, PENNSYLVANIA**

QUALITY CONTROL—thorough and continuous—assures predictable and uniform

refractories performance

from Harbison-Walker products

Through Statistical Quality Control, Harbison-Walker maintains within closest commercial limits, the highest standards of all characteristics upon which depend the best and most uniform refractory service. Comprehensive control procedure extends from the raw materials through every manufacturing detail with the aid of instrumentation and precise laboratory testing. By this highly developed technique, uniformity of product is achieved which assures predictable and consistently uniform refractories performance. It is possible to estimate service life more accurately and plan furnace campaigns with confidence. With this established uniformity of quality, operating interruptions are fewer and maintenance costs are considerably reduced.

"Lump samples" of clay received from the mine are examined after test-firing.

Determining refractoriness by the "Pyrometric Cone Equivalent" method.

Screen analysis of Brick Mix is an important control operation.

SEND FOR THIS BROCHURE

The program by which Harbison-Walker controls the properties and quality of the various refractories is described in detail in the new brochure *Better Refractories Through Quality Control.* It shows how uniformity is achieved and maintained in the refractories made from natural minerals from mines and quarries. A copy of this brochure will be gladly sent to you on request.

HARBISON-WALKER REFRACTORIES COMPANY
Pittsburgh 22, Pennsylvania

Please send me a free copy of your brochure, "Better Refractories Through Quality Control."

Name_____ Title_____

Company_____

Address_____

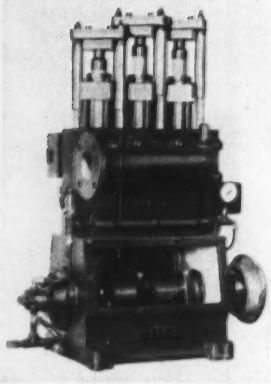
What you need here is an ALDRICH PUMP

The reliability of any central hydraulic system depends on the pump. If it's an Aldrich, you're sure of 100% availability of hydraulic power—with either oil or water.

Dependable service. Aldrich Pumps provide reliable, low-cost performance on such applications as die casting, hydraulic press operations, roll balancing, descaling and hydraulic testing. One reason is the simplicity of the Aldrich Direct Flow design, which permits horizontal straight-line flow from suction to discharge. Another is the reduced space between valves, which results in higher volumetric efficiency.

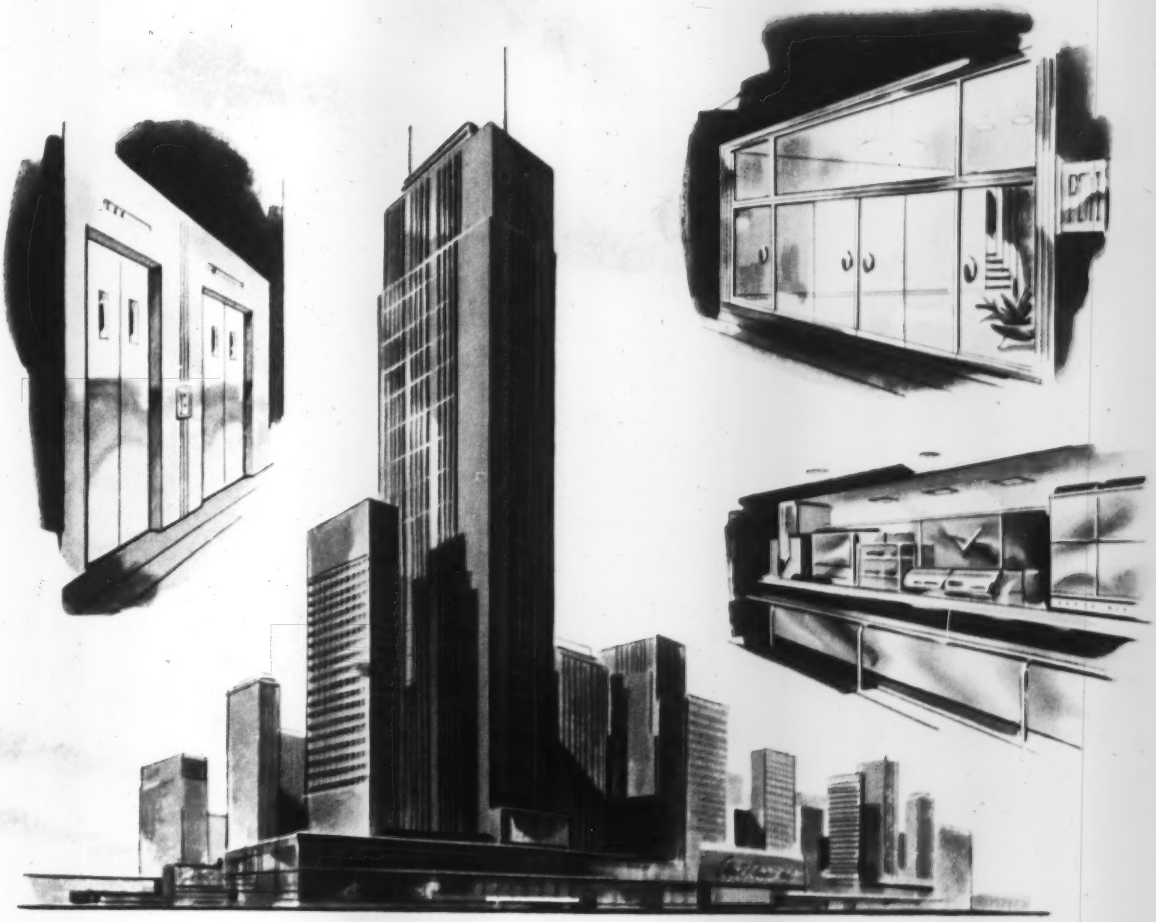
Easy maintenance. Fluid end sectionalization, changeable plunger sizes and interchangeability of parts provide fast, easy maintenance. Parts can be replaced easily and quickly, at low cost. Valves can be removed for inspection or replacement without special tools or equipment. Individual sections of the fluid end can be replaced at a fraction of the cost of conventional type fluid ends.

Get free details. Write today for a copy of Data Sheet 100, a condensed catalog and selection table covering our entire line. The Aldrich Pump Company, 18 Pine Street, Allentown, Pa.



Aldrich "Power-Pac" Direct Flow Triplex Pump has no equal in a nominal 25 hp pump for descaling, die casting, roll balancing, press operation, hydraulic testing. Pressures from 390 psi to 20,700 psi.

THE ALDRICH PUMP COMPANY



in buildings...
everybody benefits from stainless steel

the architect specifies long-lasting Stainless Steel for its strength, its beauty and its economy of maintenance. In heavy use areas and for weather-exposed panels and trim, nothing stands up or keeps its smooth finish like Stainless Steel.

the builder likes working with Stainless Steel. It is easy to install, does not dent, peel or discolor and presents no problem on matching or replacement.

the tenants enjoy living or working in buildings that are bright, clean and attractive because of Stainless Steel.

McLOUTH STAINLESS STEEL

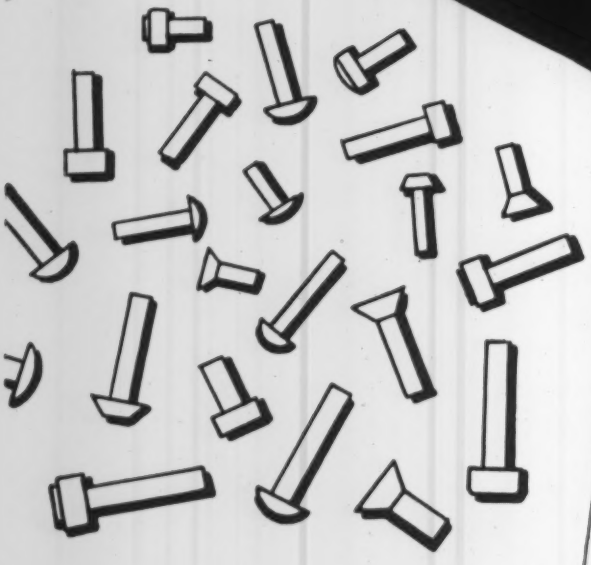
For the product you make today and the product you plan for tomorrow specify McLouth high quality sheet and strip Stainless Steel

McLOUTH STEEL CORPORATION DETROIT, MICHIGAN • MANUFACTURERS OF STAINLESS AND CARBON STEELS

New! World's Fastest!

WATERBURY FARREL "HEADMASTER"

Heads 300 To 450 Screw Or Rivet Blanks Per Min.



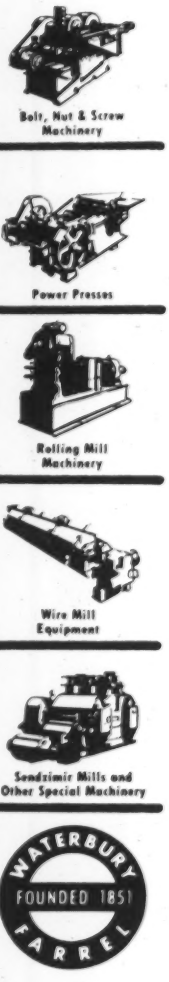
Waterbury Farrel introduces a revolutionary new concept in cold heading speeds... proven by actual production runs to be the world's fastest rates achieved by a solid die double stroke header.

Operating at speeds from 300 to 450 blanks per minute, the machine will head rivets up to ½" x ¾, machine screws up to #6 x ¾, and sheet metal screws up to #8 x ¾.

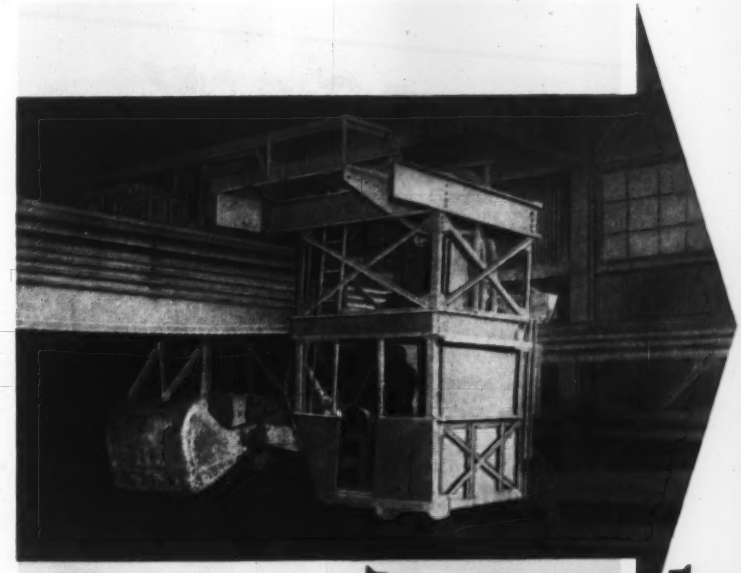
Write today for further information on Waterbury Farrel's "HEADMASTER."

WATERBURY FARREL FOUNDRY & MACHINE CO.
Waterbury, Conn., U.S.A.

Sales Offices:
Chicago • Cleveland • Millburn, N. J.



WF-33



CHANGE-OVER TO

EC&M

DYNAMIC BRAKING CONTROL

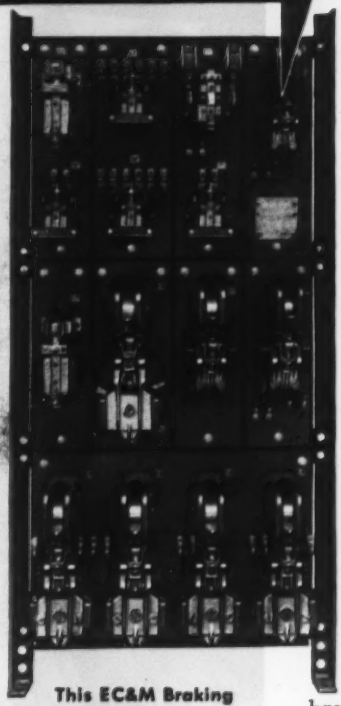
RESULTS IN

Safer, Smoother Operation

OF BUCKET CRANES

Dynamic Braking Bridge-Stop Control

provides an all-electric braking system in which *the driving motor also acts as the braking motor.* Operator applies normal stopping by means of a 2-position foot switch which gives two points of dynamic braking depending upon the speed of the crane and the accuracy of stopping desired. Should power fail, dynamic braking is automatically applied to bring the crane to rest quickly, regardless of the position of the master switch.



This EC&M Braking Panel replaces all mechanical braking devices in southern fertilizer plant and operates satisfactorily in severe acid atmosphere

Something had to be done!

One of the cranes in this plant had partially jumped the runway when power failed at the instant of plugging. Ordinary braking methods failed. Magnetically-released, mechanically-set brake wore down rapidly under hard service. Motor burnouts, shaft and gear failures spelled costly delays. Repairs were a nightmare.

So a change-over was made to all-electric braking. Costly production delays were eliminated. Maintenance became merely routine inspection of motors and controllers. Operation became 100% satisfactory. And the operators warmed up to the smoother stopping.

Dynamic Braking Bridge-Stop Control offers advantages for your cranes. Write us for a copy of Bulletin 921-6.0. It tells how and why.

SQUARE D COMPANY

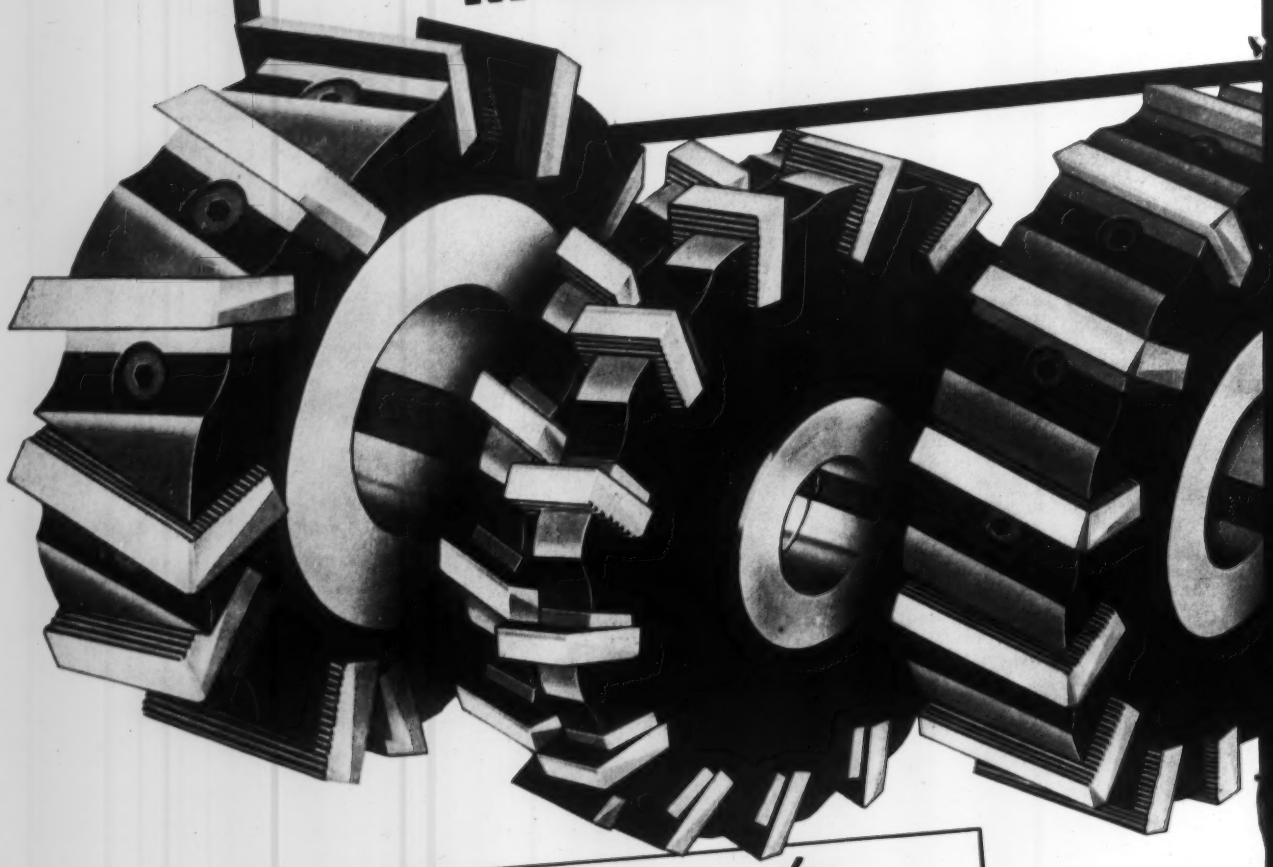
EC&M DIVISION • CLEVELAND 28, OHIO

7409

...and AGAIN

MORSE

MOVES AHEAD...



Another reason why

MORSE

means

"THE MOST"

in Cutting Tools

with a Complete Line of

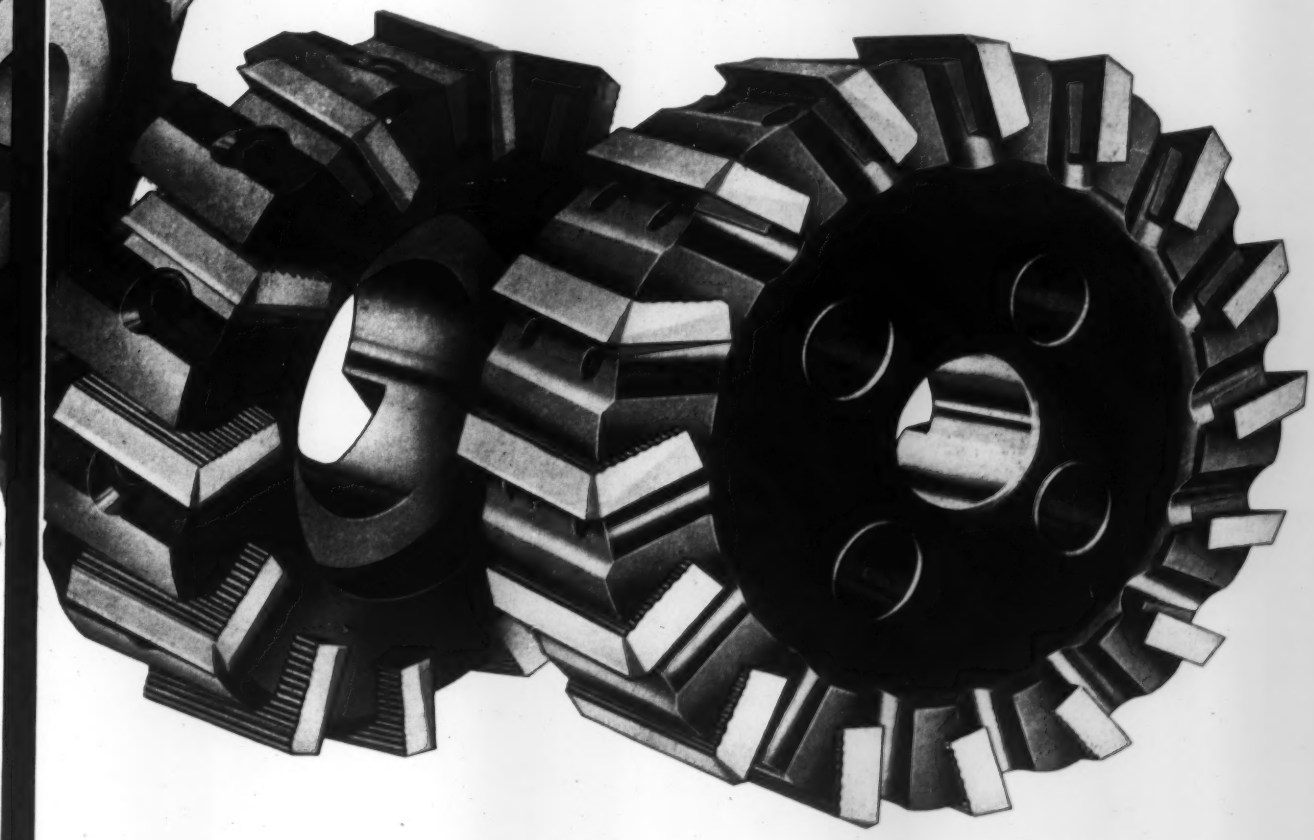
Inserted Blade CUTTERS

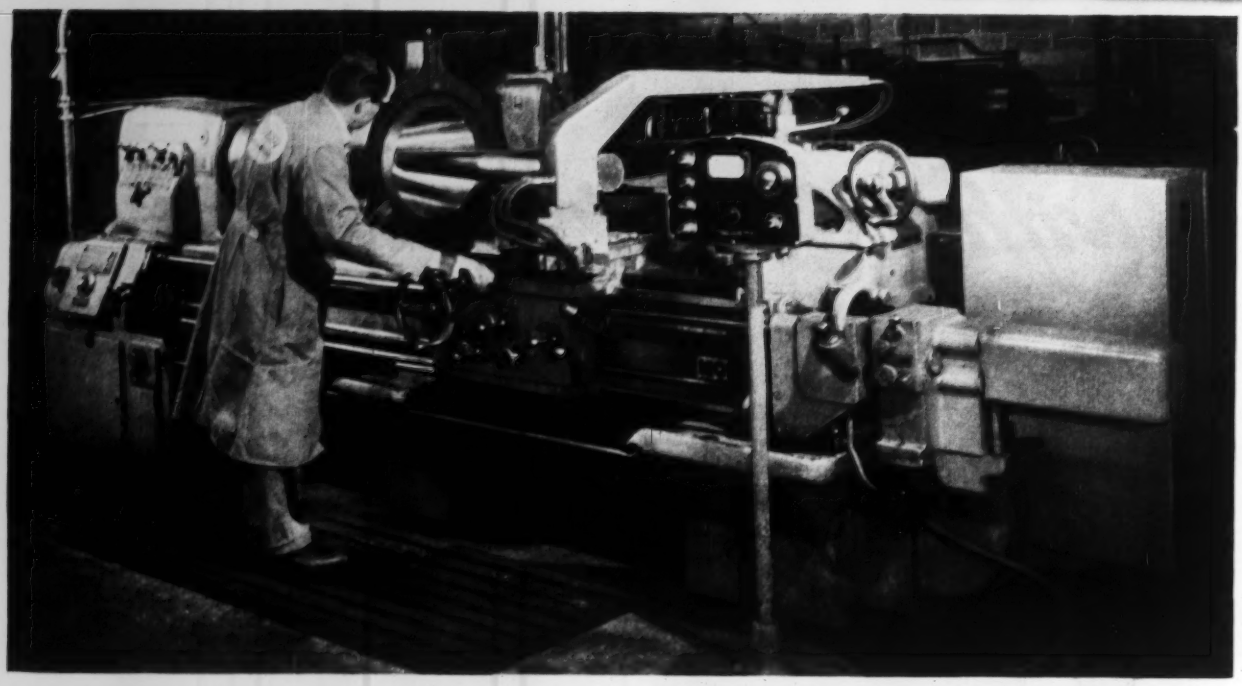
This new Morse line is complete . . . every standard type and size, plus any special up to 36"! And this new line makes the Morse-Franchised Distributor *more than ever* "the man with the most" in cutting tools.

MORSE TWIST DRILL & MACHINE COMPANY · NEW BEDFORD, MASS.

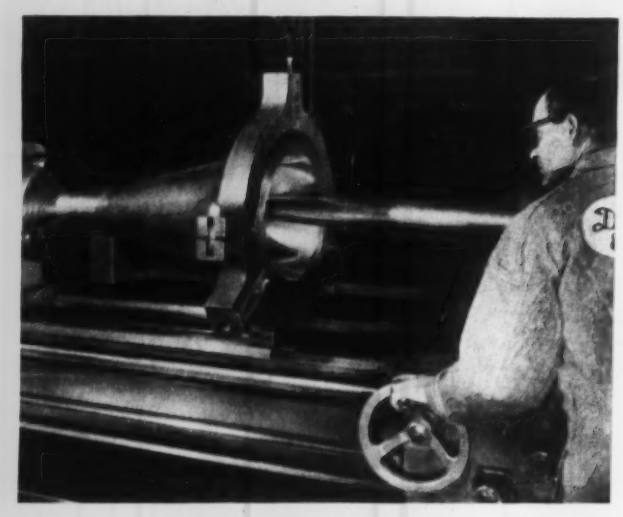
Subsidiary of VAN NORMAN INDUSTRIES, INC.

Warehouses in New York, Chicago, Detroit, Dallas, San Francisco





A Monarch 20" Series 61 Swiveling "Air-Gage Tracer" Lathe contour boring a jet cone to a depth of 31½". The I. D. starts at approximately 18½" and decreases to approximately 4". The contour of the I. D. has a radius and blend tapers. Material is the tough super-alloy called A-286, one of the toughest of all the new super-alloys to machine. "Some jobs", says Diversey's president, "can only be done on Monarch swiveling-type tracer lathes".

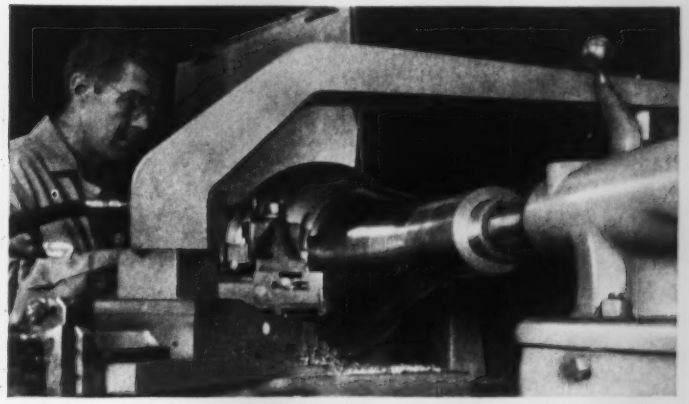


Hitch up the talents of DIVERSEY ENGINEERING COMPANY, Franklin Park, Illinois and their tracer-controlled Monarch lathes, and you get one of the most important production teams in our jet engine and guided missile programs.

Starting with one Monarch lathe seven years ago, Diversey is now the largest in the country specializing in these components. Fifteen lathes—an exclusively Monarch installation—are now in practically around-the-clock use. All but two are tracer-controlled. Latest is a 48" swing swiveling Air-Gage Tracer type machine, the capacity of which places Diversey in the position of being one of the few companies in the United States with the equipment and know-how to handle machining on some of the large, new guided missile contoured parts.

Monarch's tracer controlled lathes are more than the Secret Weapon's secret weapon—they're everybody's weapon for better production. Yours too! Ask for Booklet #2608 —or a sales engineer . . . **The Monarch Machine Tool Company, Sidney, Ohio.**

The same Series 61 turns the same jet cone, described on opposite page. This operation uses practically the full swing capacity of the lathe.



"GUIDED" LATHES for Guided Missiles

Contour Turning of "Super-alloys" Made Easy

A Monarch 20" Model M "Air-Gage Tracer" Lathe finish machines the center bulkhead of a guided missile to 63RMS. Material is heat-treated hi-nickel alloy. In the foreground of above illustration is a number of completed bulkheads while toward the tail end of the machine are some nose cones for a missile head. These are also turned on the 20" Model M. Smaller view (above right) shows clearly the unusual finish imparted.

Monarch

ACCURACY • ECONOMY • LONG LIFE

TURNING MACHINES

FOR A BETTER TURN FASTER . . . TURN TO MONARCH

like special service?

That's what you'll get at Crucible—no matter how big or small your special steel needs may be.

Crucible warehouses are conveniently located all across the country—to supply the widest assortment of special steels, when you need them.

Deliveries are dependable, service something special—because Crucible is *big enough to serve you, small enough to want to.*

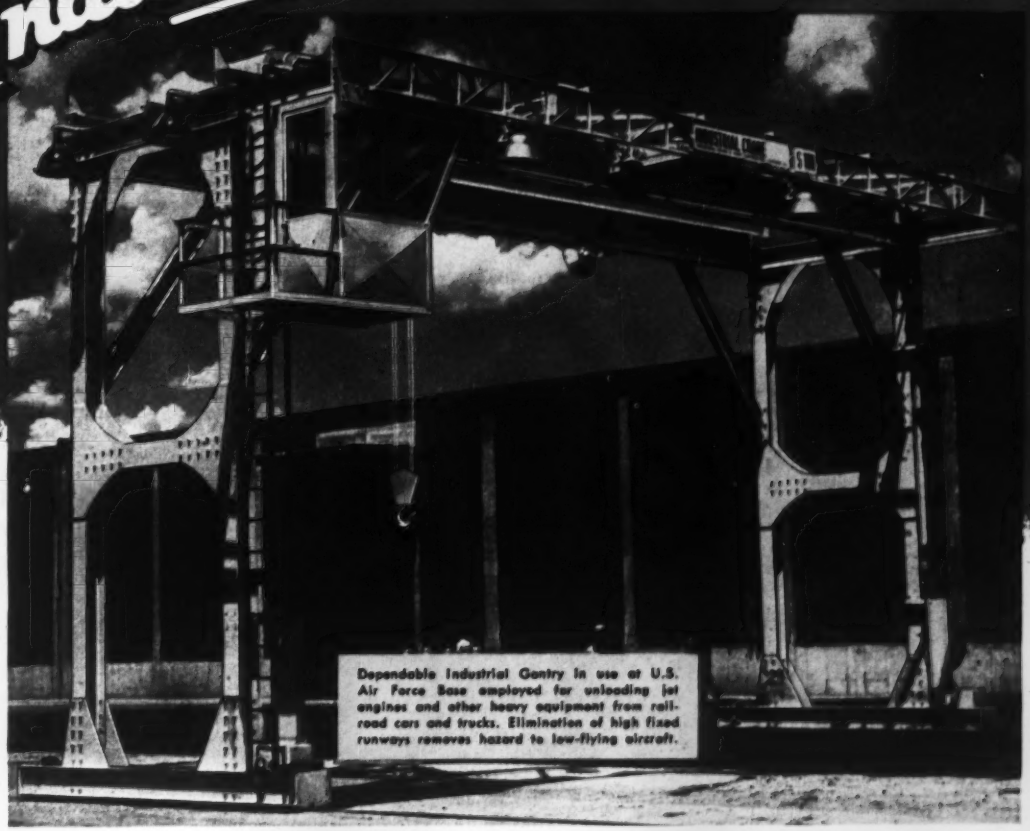
Stocks maintained of:
Rex High Speed Steel . . . ALL grades of Tool Steel (including Die Casting Die and Plastic Mold Steel, Drill Rod, Tool Bits, and Hollow Tool Steel Bars) . . . Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes) . . . Max-el, HY-Tuf, AISI Alloy . . . Onyx Spring, Hollow Drill Steel and other special purpose steels.

CRUCIBLE WAREHOUSE SERVICE

Crucible Steel Company of America

General Sales Offices, The Oliver Building, Mellon Square, Pittsburgh 22, Pa. Branch Offices and Warehouses: Atlanta • Baltimore • Boston • Buffalo • Charlotte Chicago • Cincinnati • Cleveland • Dallas • Dayton • Denver • Detroit • Harrison • Houston • Indianapolis • Los Angeles • Milwaukee • New Haven • New York Philadelphia • Pittsburgh • Portland, Ore. • Providence • Rockford • San Francisco • Seattle • Springfield, Mass. • St. Louis • St. Paul • Syracuse • Toronto, Ont.

Industrial GANTRYS CUT HANDLING COSTS



Dependable Industrial Gantry in use at U.S. Air Force Base employed for unloading jet engines and other heavy equipment from railroad cars and trucks. Elimination of high fixed runways removes hazard to low-flying aircraft.

Industrial Gantrys furnish all the "lift" you need to unload flatcars, gondolas and trucks with speed, safety and economy.

Industrial Gantrys are ideal where travel is long and where fixed overhead runways are undesirable. Gantrys are often the lowest cost crane installation where extremely long runways are necessary as in yard storage.

Industrial Gantrys are frequently used in warehouses and other industrial buildings where the supporting structure is not sufficiently rugged to permit the operation of a heavy duty overhead crane.

Industrial Gantrys are ruggedly-built, dependable, smooth-operating cranes — often the economical answer to many materials handling problems. Consult with Industrial for the most practical answers to your materials handling problems.

Designers and Builders of Overhead Cranes, Jib Cranes, Gantrys and Monorail Systems.

INGERSOLL B-W BORG-WARNER

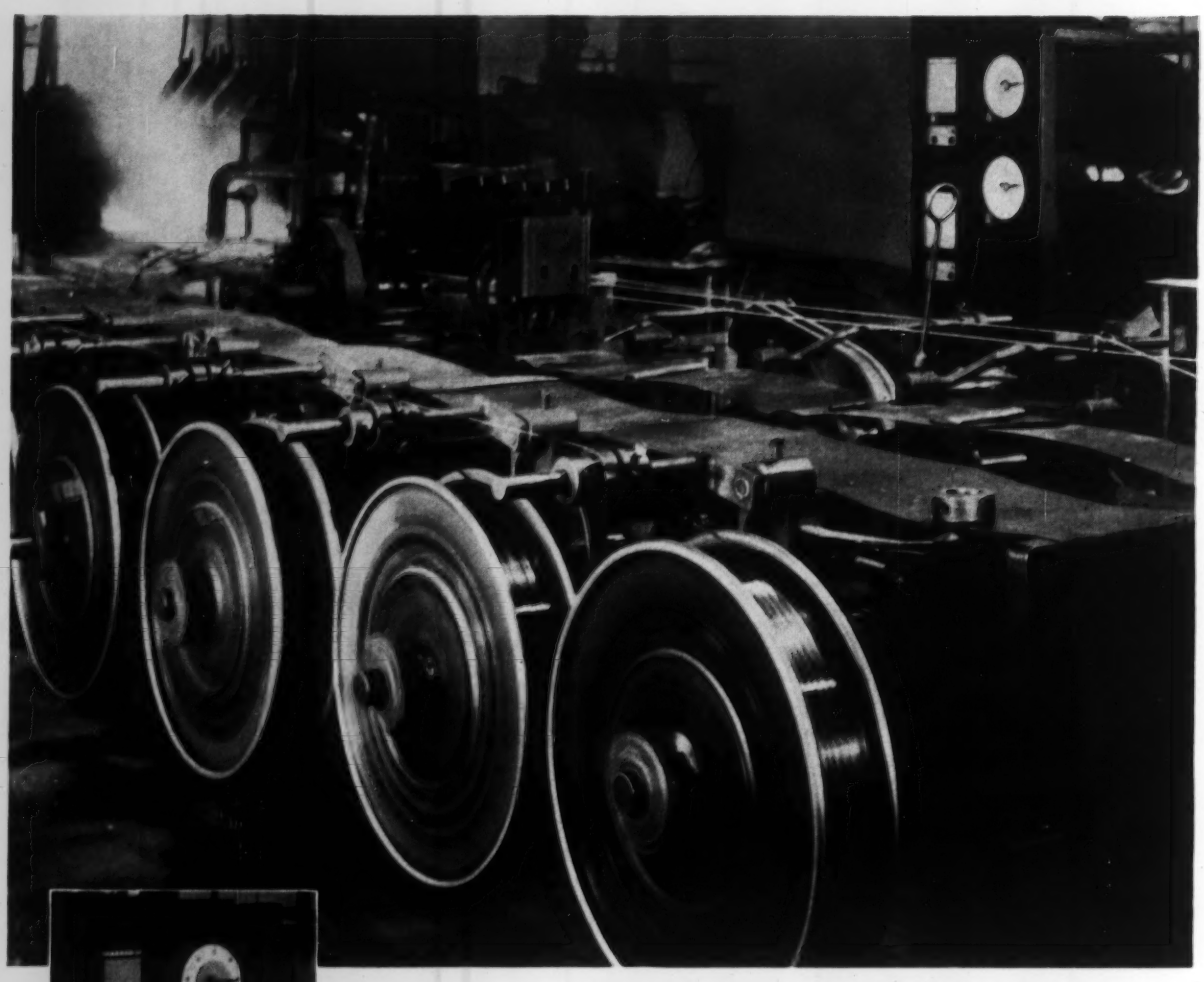
INDUSTRIAL CRANE & HOIST

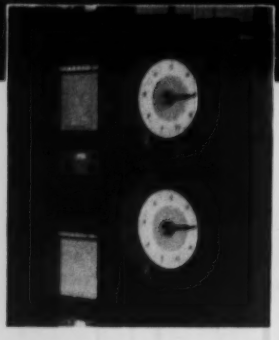
Ingersoll PRODUCTS DIVISION

BORG-WARNER CORPORATION

1503 SOUTH PAULINA STREET • CHICAGO 8, ILLINOIS

IG-1156-C





AT ATHENIA STEEL

Speedomax® H eliminates M.T.C.*

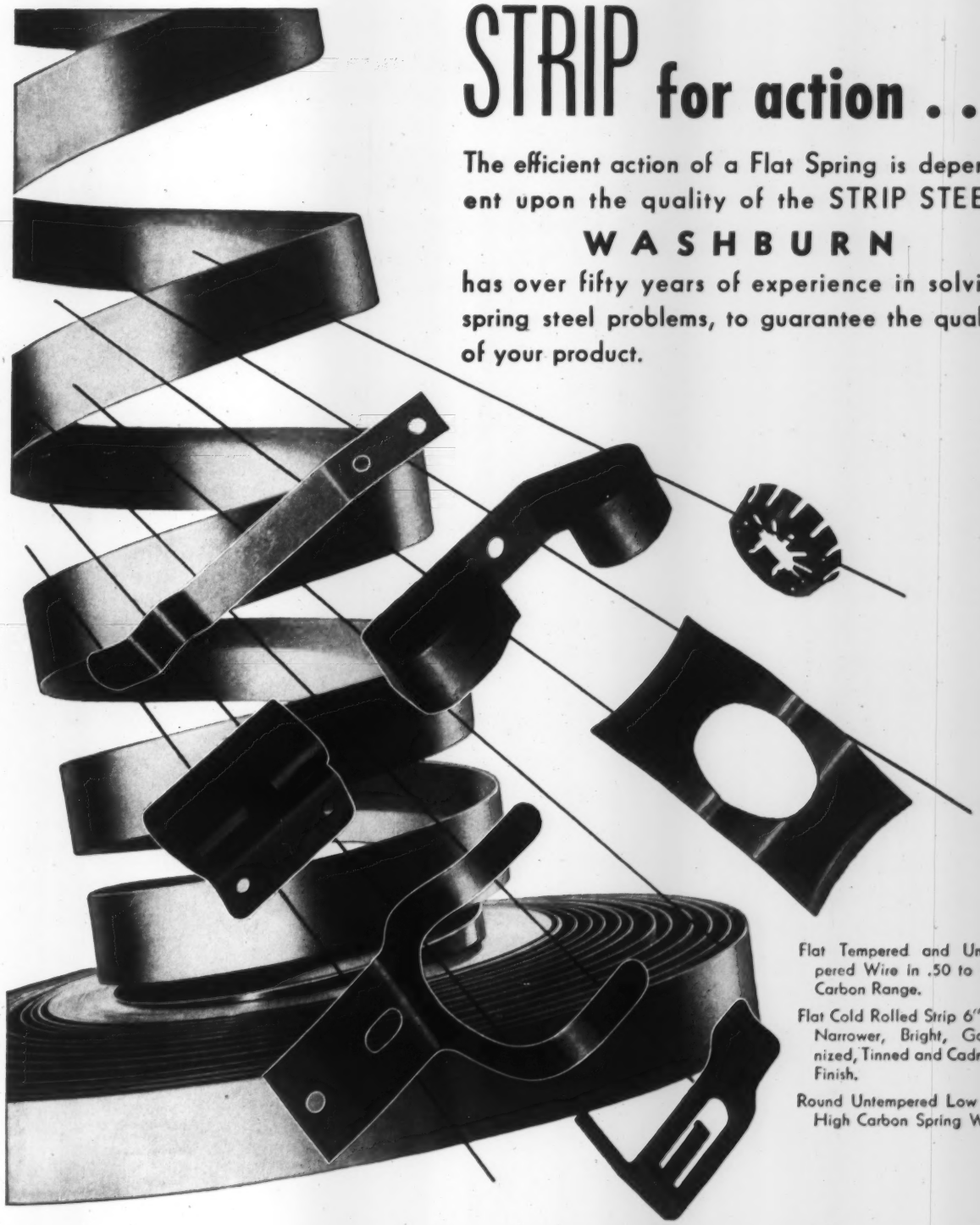
At the Athenia Steel Division of National-Standard Company—flat spring steel specialists—Speedomax H controllers are helping operators meet customer specs on cold rolled flat wire. Since installing these new instruments, production has increased . . . down-time reduced . . . and Athenia Steel is assured of the proper temperature for each charge.

In line with its modernization program, Athenia has already completed installation of Speedomax H control on two continuous gas-fired hardening and tempering lines. Former method of control required manual adjustment of valves to regulate gas input to the furnaces. But with Speedomax H, fuel input is now controlled automatically. Two Two-Position Indicating Controllers are holding temperature of the first two zones of the hardening furnace to better than ±5 F, and a 3-Action P.A.T. Controller holds the finish zone to ±2 F. A second 3-Action P.A.T. Speedomax H controller holds the tempering furnace to ±2 F.

Perhaps Speedomax H can help solve your temperature problems. For further information, contact your nearest L&N sales office or write 4957 Stenton Avenue, Philadelphia 44, Pa.

LEEDS & NORTHRUP
Instruments — Automatic Controls • Furnaces

* *Manual Temperature Control*



STRIP for action . . .

The efficient action of a Flat Spring is dependent upon the quality of the STRIP STEEL.

WASHBURN

has over fifty years of experience in solving spring steel problems, to guarantee the quality of your product.

Flat Tempered and Untempered Wire in .50 to 1.25 Carbon Range.

Flat Cold Rolled Strip 6" and Narrower, Bright, Galvanized, Tinned and Cadmium Finish.

Round Untempered Low and High Carbon Spring Wires.

WASHBURN WIRE COMPANY, NEW YORK CITY

WASHBURN

104

CLEAN, UNIFORM BILLETS — STRIP — RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

"75%

of all

electrolytic

Tinplate is made

on WEAN lines...

Seventy-five percent of all tinplate produced by the electrolytic process is made on lines bearing the Wean "Double Eagle" symbol of excellence in engineering.

This fact, itself, stands as a tribute to the ability of Wean engineers to cooperate in the creation of continuous electrolytic tinning lines that win approval of leading steel producers the world over.

The reason for such predominance: Wean helped to popularize continuous coating lines, and, through the years, has played a major role in their development. In this phase of steel-making, Wean engineers stand as the most experienced group of their kind ever assembled.

And, because these engineers are constantly searching for means to achieve even greater line efficiency, you can be certain of the finest, most advanced coating equipment available any time you assign Wean to the job.

The WEAN ENGINEERING CO., Inc.
Warren, Ohio

NET PRODUCTION

840 Bends Per Hour

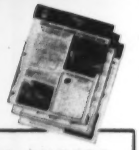
With PINES HYDRAULIC BENDER

Over-all view of Pines Size ¾ Bender at Flexsteel Spring Division used for outside job work as well as for their own manufacturing needs. Application illustrates setup for bending long side members for toy Corvette car.

Automatic Cycling Speeds Job Work for Flexsteel Spring Division - Dubuque, Iowa

Here's another typical example of fast, efficient production bending illustrating the outstanding advantages of automatic cycling, a standard feature on most Pines machines. Flexsteel Spring Division, Northome Furniture Industries, Dubuque, Iowa, used this set-up to produce frames for a toy Corvette car from ⅝" 18-gauge welded steel tubing. Records show that over a period of three months, net production on workpiece illustrated averaged 140 pieces (840 bends) per hour. On this job requiring six bends of the same radii (1 13/16"), the operator simply positions the tubing for each bend and presses the forward button. Pre-set indexing stops automatically control the angle for each bend in sequence while the operator rapidly positions the workpiece. Automatic cycling saves valuable production time and accounts for the high efficiency rate maintained.

Simple positioning gauge determines plane of each bend. View shows position for making sixth bend for right-hand frame member. Both right-hand and left-hand members are produced on same setup.



Accuracy Maintained at High Production Speeds

Another well-known advantage of Pines machines is their ability to maintain accuracy. Tolerances of .030 to .040 at several check points are commonly held without difficulty, simplifying welding, assembly, or other fabricating operations. In addition, all Pines machines are designed for small radius bending with mandrels, as well as for bends of the type illustrated not requiring mandrels. For accuracy and efficiency, it will pay you to specify Pines.

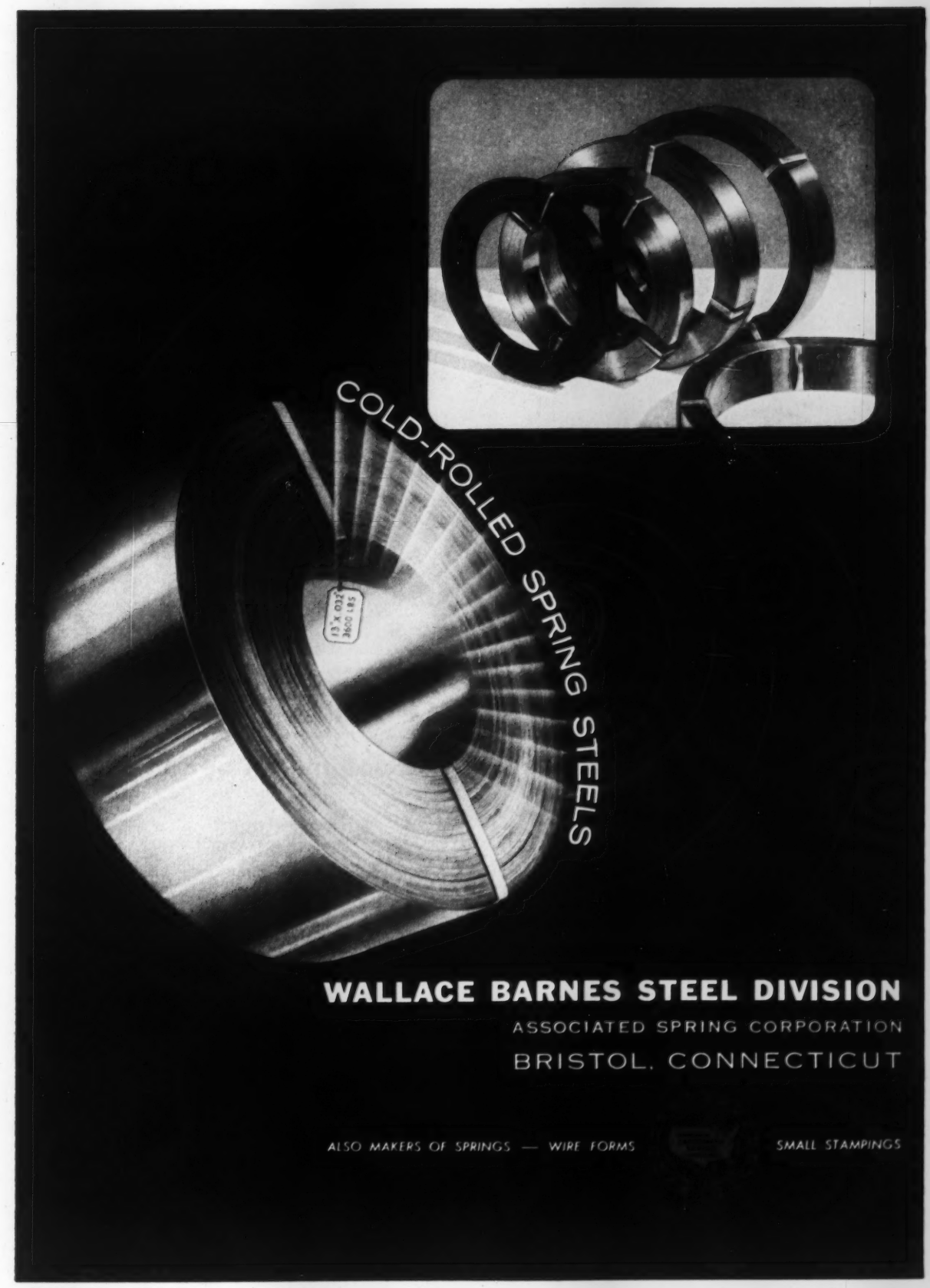
PINES ENGINEERING CO., INC.

Specialists in Tube Fabricating Machinery — 662 WALNUT • AURORA, ILLINOIS

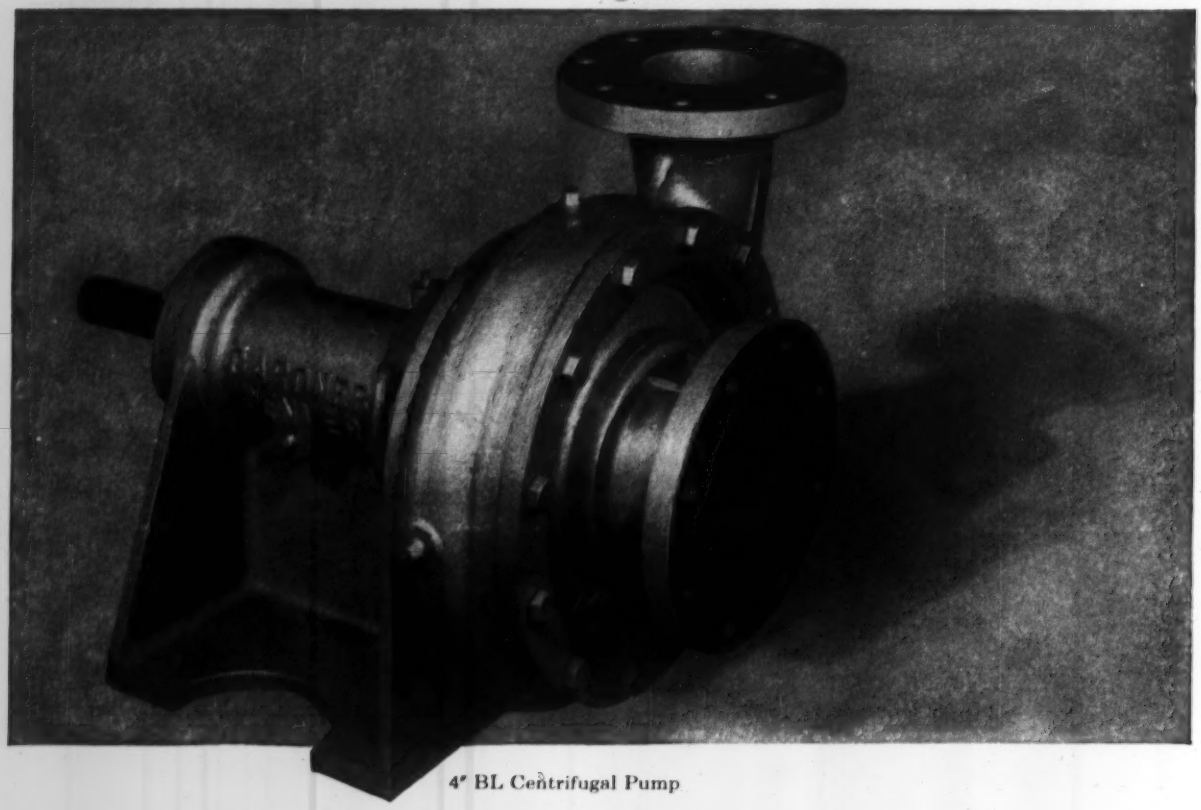
PRODUCTION BENDING • DEBURRING • CHAMFERING MACHINERY

WRITE FOR *Free* DATA SHEETS

Ask for up-to-date case study material on production bending the "Pines-Way." Full information available, including tooling and setup data used for producing steel channels, rods, extrusions, pipe, and tubing. Or for assistance on any job, ask for a Pines sales engineer to call.


COLD-ROLLED SPRING STEELS
WALLACE BARNES STEEL DIVISION
ASSOCIATED SPRING CORPORATION
BRISTOL, CONNECTICUT
ALSO MAKERS OF SPRINGS — WIRE FORMS
SMALL STAMPINGS

Gardner-Denver . . . Serving the World's Basic Industries



4" BL Centrifugal Pump

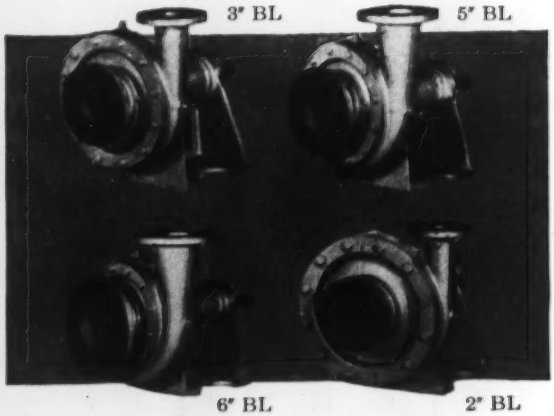
New Gardner-Denver BL Pumps

. . . stay efficient even when volume on head fluctuates

HERE'S NEWS FOR PUMP ENGINEERS: These new Gardner-Denver Centrifugal Pumps are designed to deliver peak performance over broader ranges of service conditions. BL pumps take variations—either in the head or water volume.

Each size (there are five to choose from) handles a wider-than-usual range of pressures and capacities.

Each has heavy-duty ball bearings, factory lubricated . . . extra large shaft to assure continual alignment . . . strong supporting frame . . . a trouble-free mechanical seal. Bulletin A-8 gives all the facts.

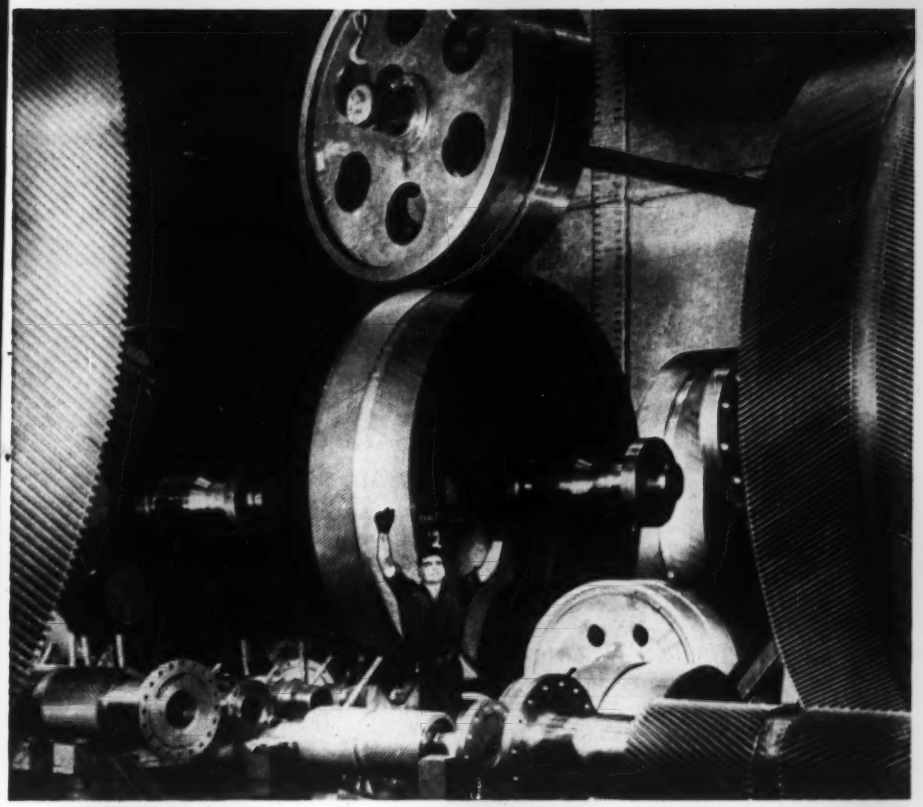


GARDNER - DENVER

THE QUALITY LEADER IN COMPRESSORS, PUMPS, ROCK DRILLS AND AIR TOOLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

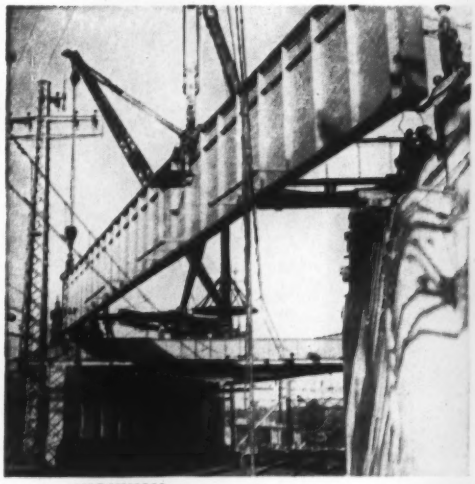
Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

BARIUM STEEL—active in America's growth



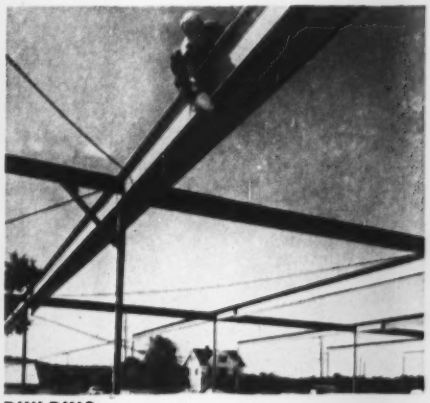
MARINE propulsion gears, an integral part of General Electric ship propulsion units, use steel plate from Barium's Phoenix Iron & Steel Company, Plate Division. These massive web plates are welded to forged steel rims and hubs—the most practical method of construction for large diameter marine gears (up to 162⅛ feet). In addition to steel plate Phoenix also produces structural steel shapes, heavy wall seamless pipe, and turns out large and small steel fabrications.

MATERIALS-HANDLING at this East Coast shipyard centers around the Clyde crane above with its 20-ton capacity, 65-foot reach and mobile 70-foot tower. It's only one of many cranes that Barium's Clyde Iron Works has supplied to this customer. If you've got a materials-handling problem coming up, chances are a Clyde crane, hoist or unloader can give you the lift you're looking for.



HIGHWAY builders timed the installation of this 132-ton, 180-foot-long girder fabricated and erected by Barium's Phoenix Bridge Company at an incredible 27 minutes. This Phoenix-built bridge will carry the New England Thruway over the 4-track main line of the New York, New Haven and Hartford at New Rochelle, New York. Part of the credit for quick work against a tight railroad schedule goes to the Barium-built 100-ton Clyde derrick.

Project of New York State Dept. of Public Works. General Contractors: Arthur A. Johnson Corp., MacLean Grove & Company, Inc.



BUILDING going up here (New Providence, New Jersey) is a new plant for EXCO, Inc. Structural steel comes from Barium's Phoenix Iron & Steel, Structural Division. Elizabeth Iron Works of Elizabeth, N. J. are steel contractors on this job; they find Barium a good company to work with on small as well as large jobs.

CONSTRUCTION of New York's 30th Street Heliport began as this Wiley floating crane with its 110-foot boom slammed the first steel pile down to bedrock. Barium's Wiley Manufacturing Company, the nation's largest manufacturer of floating cranes, built this one for George W. Rogers Construction Corp., contractors for the Port of New York Authority. Wiley also produces work boats and steel barges.

BARIUM
STEEL CORPORATION
A GROUP OF INTEGRATED COMPANIES

Steel producers, fabricators, product manufacturers

For further information on this close knit, alertly managed team of companies—its engineering resources, production facilities or specific products—write for "The Barium Story" to:

25 BROAD STREET, NEW YORK 4, N. Y.

6.4

You Get MORE

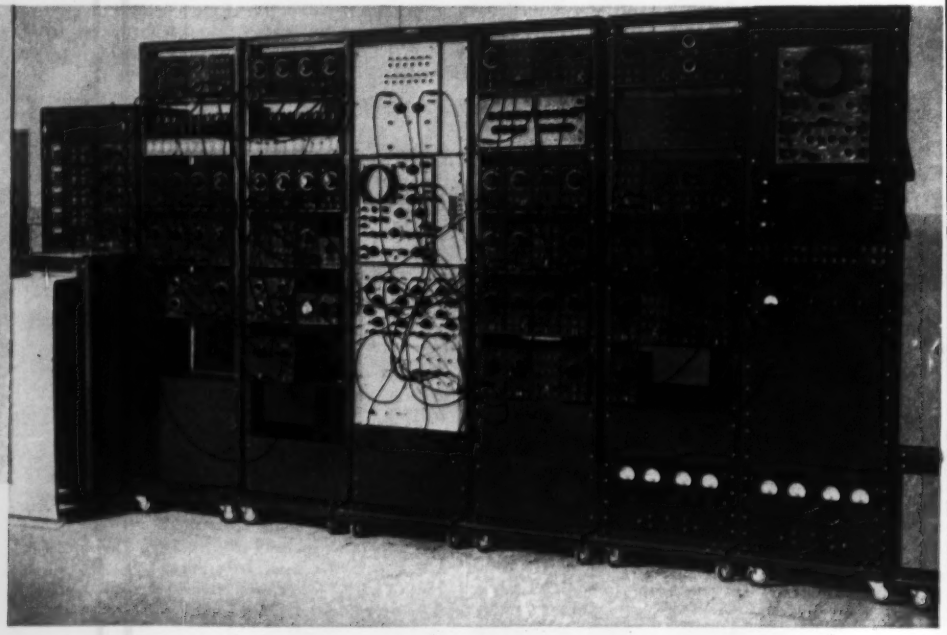
...because ALLIS-CHALMERS "COORDINEERS" the Entire System

EFFECTIVE regulation is more than a matter of good regulator design. It embraces overall *system* design... the integration of interdependent components — generators, exciters, motors, regulators and other control equipment. As manufacturers of a most diversified line of electrical generation, distribution and utilization equipment, Allis-Chalmers, of course, is in a unique position to provide this practical approach to mill regulation.

Allis-Chalmers maintains separate departments, staffed by research, design, manufacturing and application specialists for each product. "Coordineering" results from an interdepartment exchange of ideas and technical information correlated in *one* department specializing in metal producing industry application. In this department, components are matched to meet the requirements of your job. Responsibility for *system* performance rests with one company.

Analytical Facilities Utilized...

System performance is simulated in the computers to get optimum configuration of components. Time constants and exciter ceilings necessary for desired response are established.



LIVE BETTER ELECTRICALLY

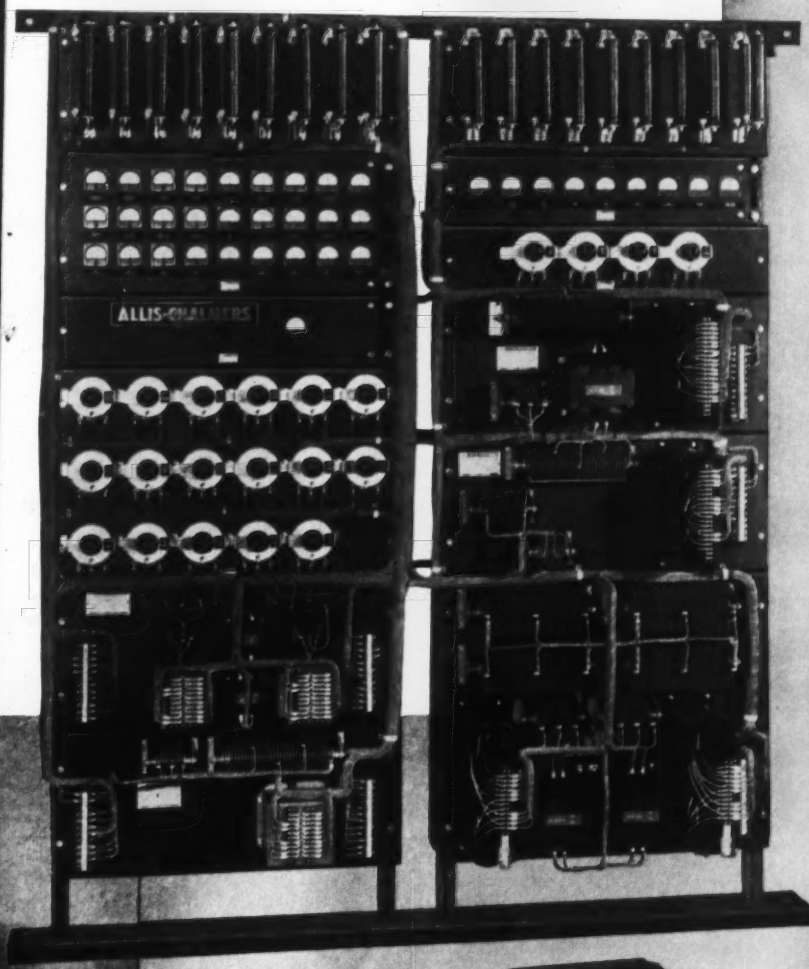
Regulex is an Allis-Chalmers trademark.

ALLIS-

STEEL

Efficient Regulation

ALLIS-CHALMERS
Regulators



For MILL CONTROL

Three Types Available

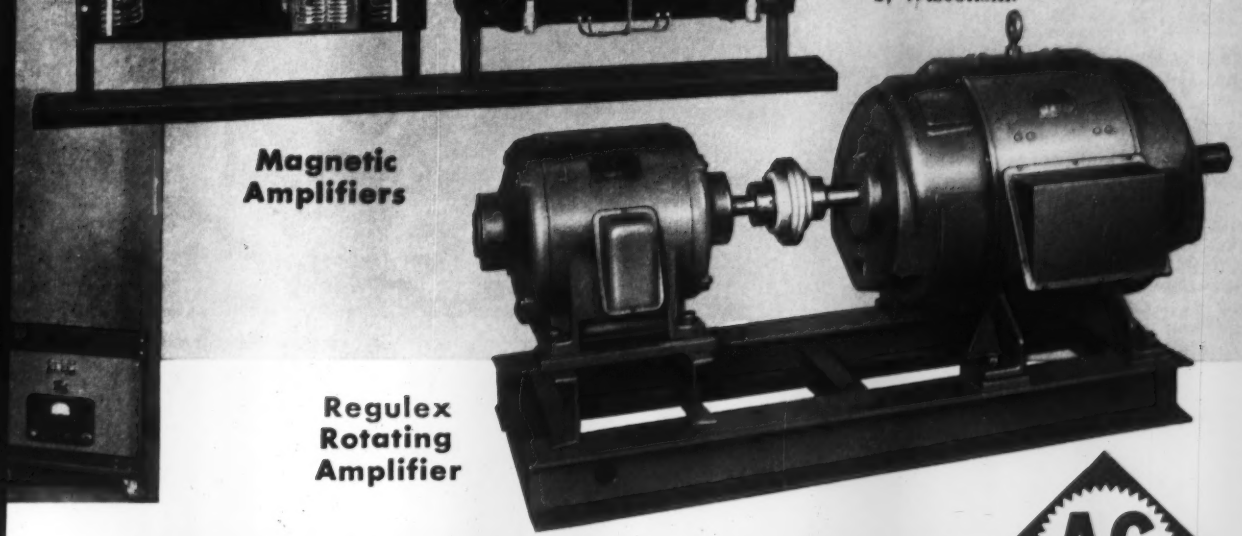
1 ***REGULEX* Rotating Amplifier** — Applicable where high power levels for reversible output are desired.

2 **Magnetic Amplifiers** — Applicable where low power levels for reversing or high power levels for non-reversing are desired.

3 **Combinations of Rotating and Magnetic Amplifiers** — Each complements the other for maximum regulating efficiency.

Get all the facts. See your Allis-Chalmers representative or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

Magnetic Amplifiers



Regulex Rotating Amplifier

CHALMERS

A-C ALLIS-CHALMERS

A-5030

There are 7 good reasons for specifying

RODINE®

—an international standard
for pickling acid inhibitors

- Metal savings range from 5 to 15 pounds per ton of steel pickled.
- Acid savings range from 3 to 30 pounds per ton of steel pickled.
- Baths can be operated longer and less acid is required to keep them at desired concentration—costs of charging and cleaning are reduced, less handling and storing of acid is required, and there is less spent liquid to be disposed of.
- Rejects are reduced—steel pickled in acid inhibited with Rodine comes out of the bath with uniformly smooth, bright clean surfaces, free of pits, blisters and smut.
- Many alloy steels can be pickled in the same bath with low-carbon steels without either becoming discolored—and both get complete protection.
- Rodine is stable at any pickling temperature.
- Rodine requires no premixing, is available in powdered and liquid form, foaming and non-foaming types, in a number of grades designed for the many requirements of sulfuric, muriatic and phosphoric acid pickling.

For the complete story, send for "Efficient Pickling with Rodine."

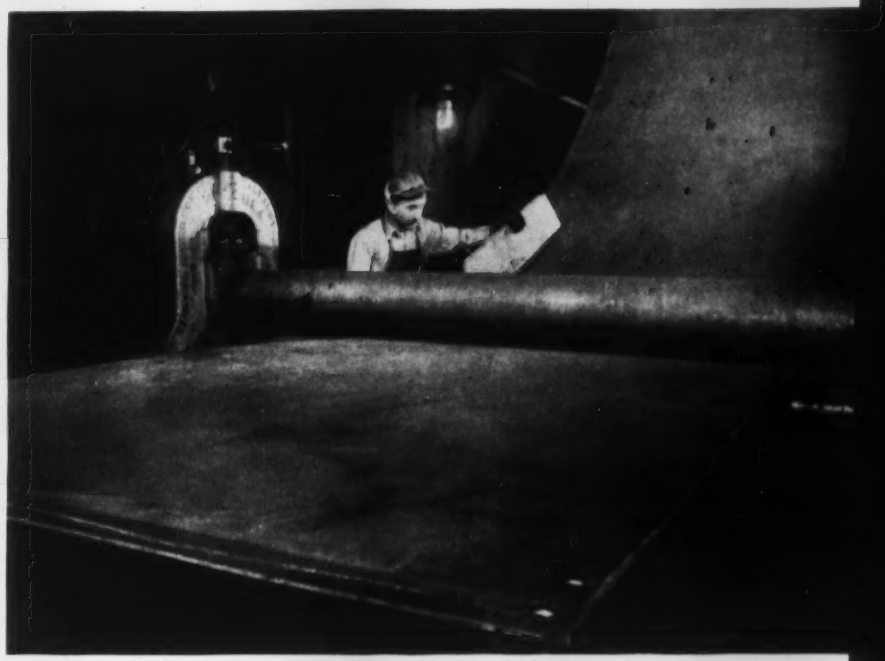
AMERICAN CHEMICAL PAINT COMPANY, Ambler 19, Pa.

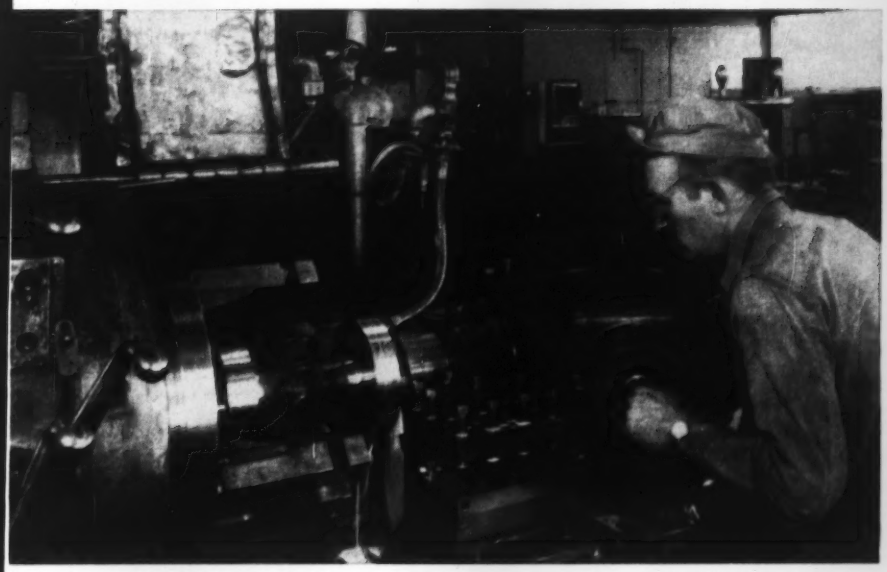
DETROIT, MICH. • ST. JOSEPH, MO. • NILES, CALIF. • WINDSOR, ONT.

CHEMICALS ACP PROCESSES

HOW USS "T-1" STEEL IMPROVES THESE PRODUCTS

▲ **Increases Durability of Buckets.** Oaks Welding, Incorporated, Columbiana, Ohio, repairs mining equipment on a custom basis. They rebuilt the 4½-yd. dragline bucket shown here with USS "T-1" Steel. Sides, bottom, and runners were made from USS "T-1" Steel . . . are actually far stronger and more durable than when the shovel was new . . . are better able to withstand severe impact abrasion in all kinds of weather.





Eliminates Normalizing. A-1 Bit and Tool Company, Houston, Texas, has converted exclusively to USS "T-1" Steel for jigs and fixtures on its turret lathes. The reason: USS "T-1" Steel, being already heat-treated, doesn't require normalizing before final machining. "T-1" doesn't warp and distort during welding. Jigs now are machined, welded, and ready for mounting. USS "T-1" Steel saves money, speeds production, and reduces rejects.

▲ **Simplifies Fabrication.** Fairmont Machinery Company, Fairmont, West Virginia, is using USS "T-1" Steel in thicknesses up to ⅜ inch to build an *unlined* coal storage bin. "T-1" Steel's abrasion and corrosion resistance make it an ideal choice for this type of service. In fabrication, high-yield-strength USS "T-1" Steel was cold-formed on equipment normally used to form carbon steel. It will be welded in the field to cut costs. It will be simpler to build, because it will need fewer stiffening members and will be lighter in weight than typical coal storage bins.

HOW IT CAN HELP YOU

USS "T-1" Steel, with its high minimum yield strength of 90,000 psi and its minimum tensile strength of 105,000 psi, can help you design or build lighter-weight equipment that will last longer. Its unusual toughness can help you design or build equipment capable of taking severe impact abuse at sub-zero temperatures. Its excellent weldability can help you to cut the cost of fabricating highly stressed parts and to reduce repair and maintenance expenses. Its good creep rupture strength can help you to put more durability in equipment that operates at temperatures as high as 900 degrees F.

Somewhere in your operation, versatile USS "T-1" Steel can help you. Write, wire, or phone United States Steel, Pittsburgh 30, Pa.

UNITED STATES STEEL CORPORATION, PITTSBURGH · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO · TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST · UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS "T-1" CONSTRUCTIONAL ALLOY STEEL

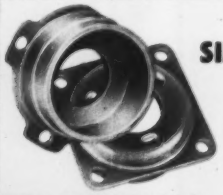
SEE THE UNITED STATES STEEL HOUR. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

UNITED STATES STEEL

CARBURIZING

1 This is the operation for which the Leland salt bath was originally purchased. Work is heated at 1650° for 30 minutes, oil quenched and washed. A consistent, scale-free 0.005" case with surface hardness of R_{15N} 75/80 is obtained.

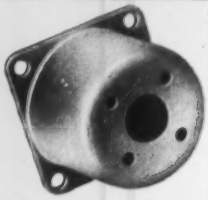
SIMULTANEOUS BRAZING AND CARBURIZING



2 Simultaneous brass brazing and carburizing cut cost from $79 to $13.11 per 1,000 parts, eliminated 3 handling operations, saved time. Average strength of brazed joints is 40,000 PSI. Case depth is 0.005"—0.007" with R_{15N} 80/85 surface hardness.

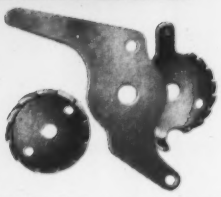
BRAZING

3 Ajax Salt Bath brass brazing of this assembly reduced costs from $14.20 to $9.10 per thousand—without considering the reduction in rejects from 25% to less than 1% and elimination of 3 additional treatments previously needed with copper brazing.



HARDENING

4 SAE-1050 and 1065 cold rolled parts are hardened in the same Ajax bath used for the 3 other operations. Hardened parts will bend 45° before fracturing. The "pick-up" of a superficially carburized case is not objectionable.



4 Cost-Cutting Operations with One AJAX Salt Bath

...that saved $37,000 the first 8 months!

Write for details outlining the G. H. Leland Inc., multi-use operation of its Ajax salt bath.

Let Ajax engineers demonstrate similar heat treating savings. You get actual proof on your own work samples in the Ajax Metallurgical Service Laboratories. No cost or obligation.

During its first 8 months on the job, this Ajax Electric Salt Bath Furnace saved $37,000 in the plant of G. H. Leland, Inc., Dayton, Ohio. This saving was figured after deducting *all* operating costs and 20% annual equipment depreciation!

Or, to put it another way, the amazing versatility of the Ajax furnace installation *enabled it to pay for itself in just a few months of use!*

Not only does the Salt Bath handle all four heat treating operations described and illustrated above . . . but the Leland model shop uses it for odd jobs as well.

Work is scale free. Distortion is no longer a problem . . and the firm's entire parts processing has been effectively streamlined.

AJAX HULTGREN

AJAX ELECTRIC COMPANY
952 Frankford Ave., Philadelphia 23, Pa.

electric SALT BATH furnaces

Associated Companies: Ajax Electric Furnace Corp. • Ajax Electrothermic Corp. • Ajax Engineering Corp.

How the right "COAT" solves many spring problems

● Unless you yourself go in for forming wire springs, you have no idea what a tricky business it is. For one thing, as every fabricator knows, it takes extreme uniformity in the wire to obtain the precise dimensions and the exacting tension, torsion or compression characteristics so often required.

But uniformity alone won't always do the trick! As a leading supplier of special wire for tougher-than-usual spring requirements, National-Standard has delved deep into production problems and has come up with answers that help many a fabricator hold better to tough specifications and produce faster with less waste and more profit!

Time and again, for example, National-Standard has shown that merely a change in wire *coating* or lubrication quality is of major importance in forming operations. Proper coating also helps gain uniform dimensional response to heat treating. Quite often, in fact, troubles chalked up to wire variance are really the fault of improper coating or finish.

Helping fabricators solve problems and cut costs is a National-Standard specialty. We're geared for it and make a point of it. Try us and see!

NATIONAL-STANDARD COMPANY • NILES, MICHIGAN
Tire Wire, Stainless, Fabricated Braids and Tape

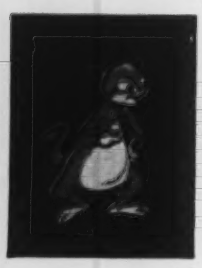
ATHENIA STEEL DIVISION • CLIFTON, N. J.
Flat, High Carbon, Cold Rolled Spring Steel

REYNOLDS WIRE DIVISION • DIXON, ILLINOIS
Industrial Wire Cloth

NS NATIONAL-STANDARD Company NILES, MICHIGAN

WAGNER LITHO MACHINERY • JERSEY CITY, N. J.
Special Machinery for Metal Decorating

WORCESTER WIRE WORKS DIVISION • WORCESTER, MASS.
Round and Shaped Steel Wire, Small Sizes



Duplication

Duplication

KOPY-KAT Duplication

is a direct hydraulic transfer with no intermediate motions

machining is completely automatic

there is no chance for irregularities or error in final work

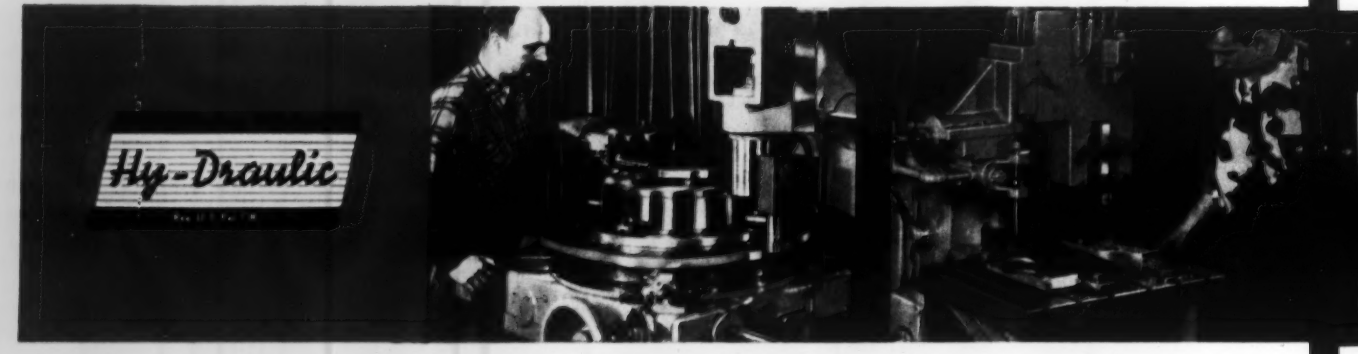
The KOPY-KAT is adaptable to an endless variety of duplicating jobs, from the simplest to the most complex. Manufactured specifically by Rockford Machine Tool Co. for use on new machines, it becomes an integral operating part of any hydraulic shaper, planer or slotter on which it is installed.

Investigate the KOPY-KAT which duplicates automatically with the ease of straight-production machining . . . and faithfully reproduces many forms previously considered impossible to machine.

Ask a Rockford Machine Tool Co. representative for further information . . . or write directly to us.

Kopy-Kat Installed on Hydraulic Slotter

Kopy-Kat Installed on Hydraulic Ram Shaper

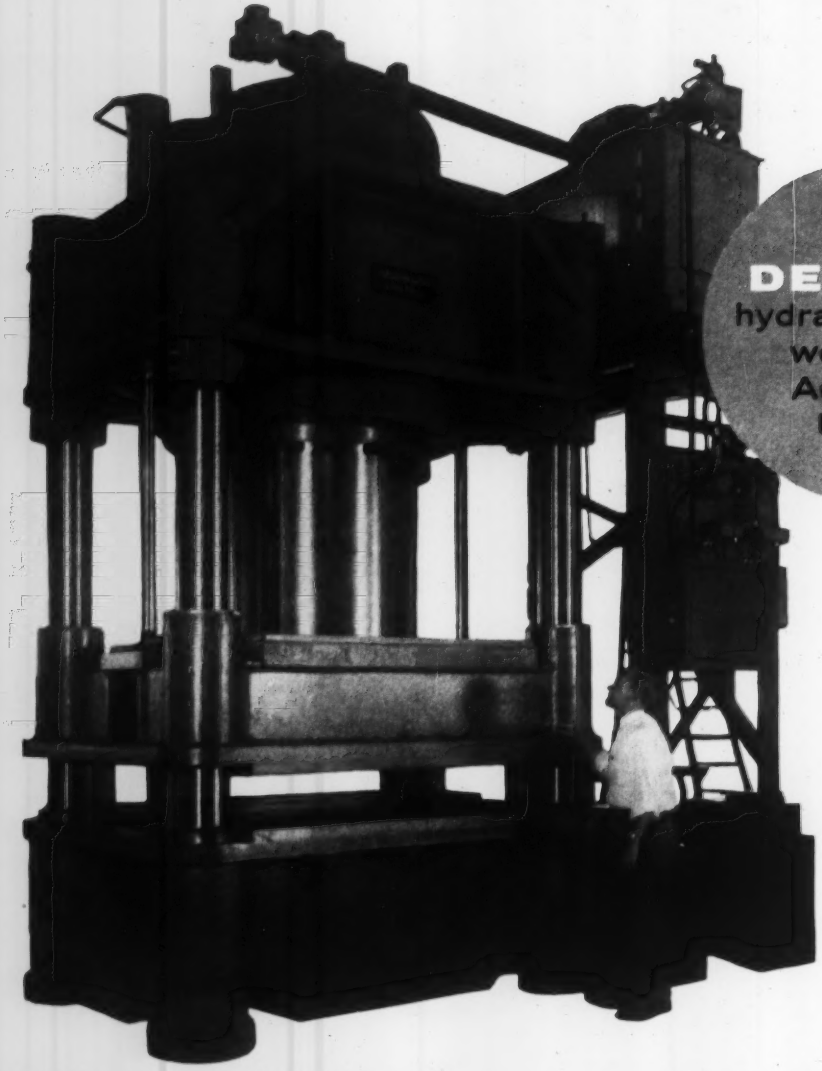


SHAPERS · PLANERS · SLOTTERS · SHAPER-PLANERS · LATHES

Kopy-Kat Installed on Hydraulic Planer

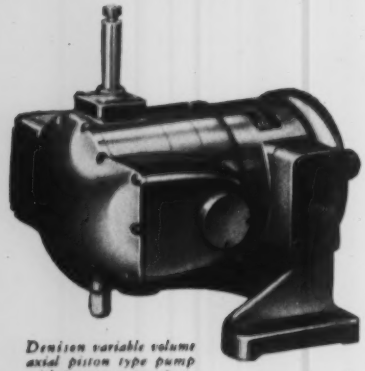
A new motion picture film "The Rockford Kopy-Kat" is available through your local distributor.

ROCKFORD MACHINE TOOL CO. ROCKFORD, ILLINOIS



How **DENISON** hydraulic power works for Adamson United

Precision control for a metal monster



Denison variable volume axial piston type pump with pressure compensating control, key to this hydraulic system for Adamson United Press.

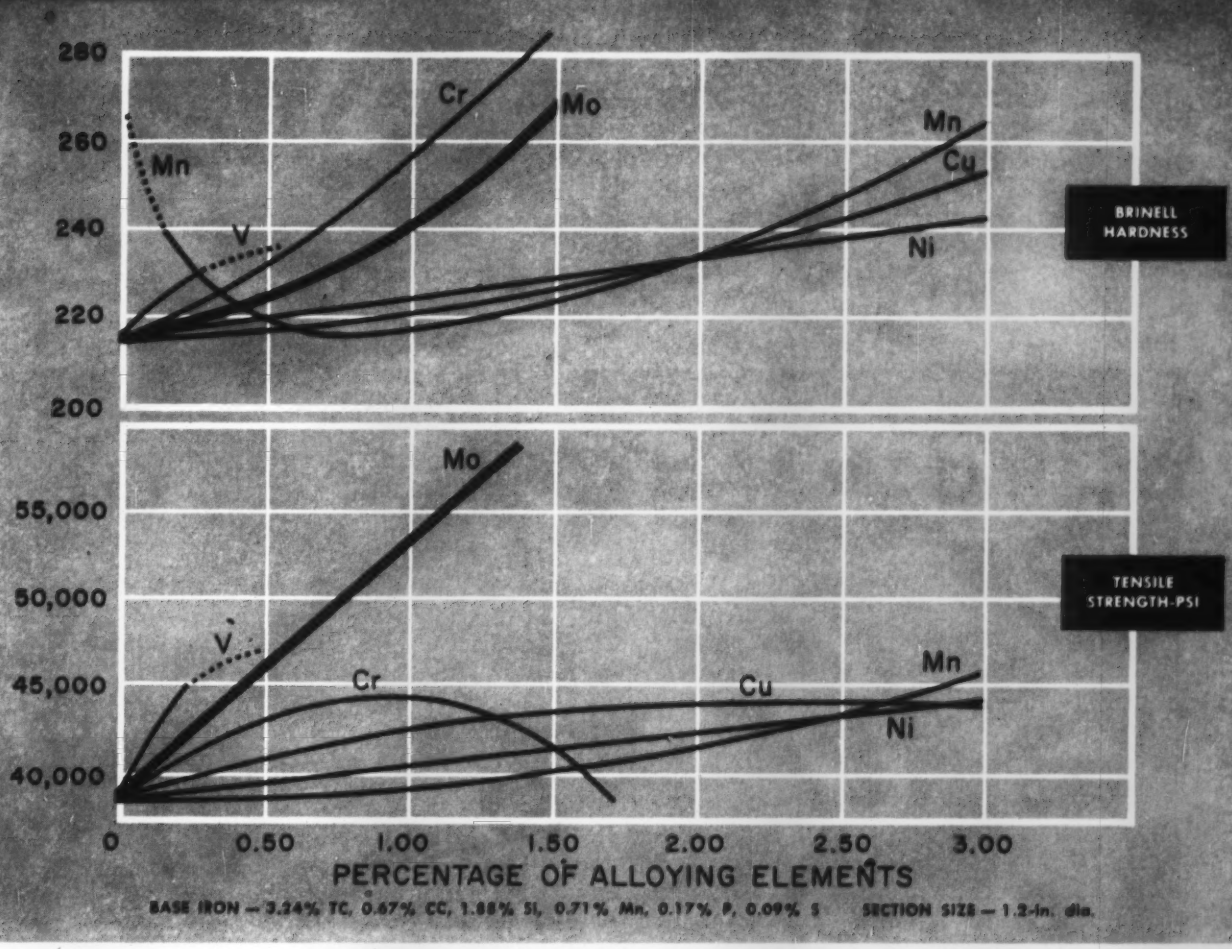
● To Denison Engineering went the task of designing accurate, foolproof control equipment for this huge compacting press built by Adamson United, Akron, Ohio. Covering more than 40 square feet of platen area, the press has a 40-inch ram designed to operate on a 2300 psi hydraulic system.

The control system developed by Denison employs a variable-volume axial-piston pump driven by a 15 h.p. motor. A manifold-type hydraulic panel completes the system.

Engineering consulting service like this is available to you at all times to save your design time and assure dependable, efficient performance of your hydraulic circuits. Write us. Denison Engineering Division, American Brake Shoe Co., 1180 Dublin Road, Columbus 16, Ohio.

HYDRAULIC PRESSES • PUMPS • MOTORS • CONTROLS

DENISON HydrOILics



Note how additions of moly, up to 1.5%, produce proportional improvements in strength. And, with moly, hardness increases much more slowly. It means higher strengths can be used with less danger of impaired machinability.

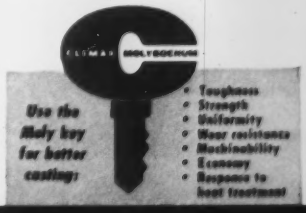
each ½% Moly adds 7000 psi to strength of cast iron...

A little moly adds a lot of strength — for molybdenum increases strength more than any other common alloying element, with the exception of small vanadium additions. A rule of thumb is that fifty points of moly raise tensile strength 7000 psi. And without sacrificing toughness. Actually, moly improves toughness at least as much as strength.

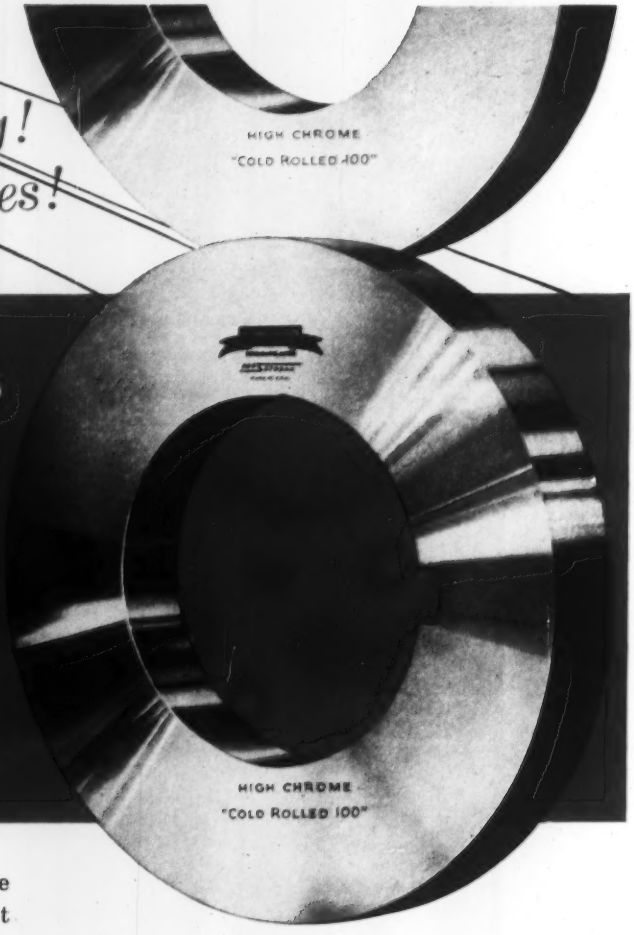
What's more, versatile moly aids in obtaining uniform response to heat treatment . . . and in producing machinable, growth-resistant castings. Moly is easy to use, too. With most grades of cast iron, moly requires no change in the character of the charge, normal melting practice, or the base metal. And foundrymen like the fact that the small additions necessary may be made at the spout or in the ladle.

Write now for "Why Moly Iron". It's the full story of how and why moly adds strength faster than hardness, how it increases fatigue and torsional strength—in short why moly makes better cast iron. Climax Molybdenum Co., Dept. 3, 500 Fifth Avenue, New York 36, N. Y.

CLIMAX MOLYBDENUM



Lapped Surfaces!
Precision Grinding!
Keener Cutting Edges!



SIMONDS
RED STREAK
Forged ROTARY SHEAR KNIVES

Because you need clean, accurate slitting, we couldn't be fussier about the steel, the heat treating, the grinding and the accuracy of our Red Streak Shear Knives . . . and you get the cleanest, most accurate slitting around!

To begin with, we furnish the *right* Simonds Steel for each shearing application . . . High Chrome, Special Alloy or High Speed . . . forge it for added density and resistance to chipping and then precision grind for the utmost accuracy in operation.

On-the-job results prove the advantages of Simonds high grade tooling, both knives and spacing collars . . . advantages that mean savings in sharpening and replacement costs as well as in cleaner, more accurate slitting.

For the knives you need for your operations send today for the free "Shear Selector Chart" to help you cut costs as well as metal.

SIMONDS
Heat-Treated
SEPARATOR DISCS

These discs are made of Simonds saw steel — heat treated for added toughness and resistance to wear. They stay flat . . . will last for years. Furnished with either black or ground finish.

SIMONDS
SAW AND STEEL CO.
FITCHBURG, MASS.

Factory Branches in Boston, Chicago, San Francisco and Portland, Oregon
Canadian Factory in Montreal, Que., Simonds Divisions: Simonds Steel Mill, Lockport, N. Y., Heller Tool Co., Newcomerstown, Ohio
Simonds Abrasive Co., Phila., Pa., and Arvida, Que., Canada

P&H Welding Positioners give you

EXTRA CAPACITY

for BIGGER PRODUCTION SAVINGS

Exclusive P&H design features permit handling greater positioning loads for every dollar you invest

Positioned welding is *downhand* welding, that permits your weldors to use larger, hotter rods for higher deposition rates. This extra welding speed and the savings in handling of weldments cut welding costs as much as 50%.

When economies like this are possible, it pays to get P&H positioners. Size for size, they can handle the widest range of weldments — give you the greatest capacity per dollar invested. The chart below compares the load capacities of positioners in the 3000-lb. class and proves the extra value of P&H.

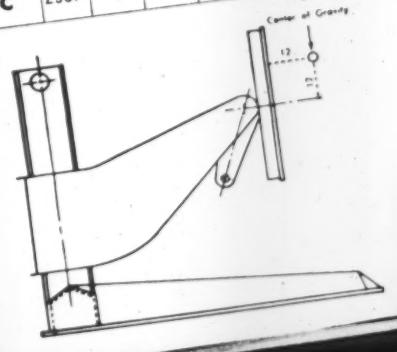
This extra-capacity advantage is found in all sizes of P&H positioners. A free load-capacity table is available to help you select the model best suited to your needs. Just send in the coupon.

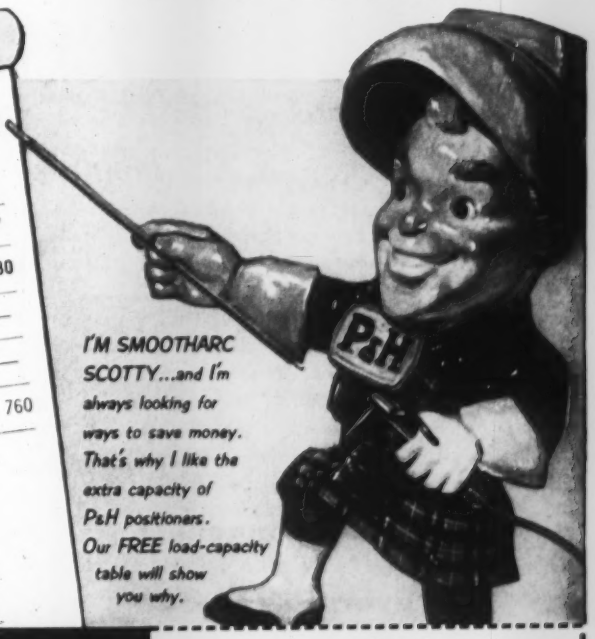
HARNISCHFEGER
MILWAUKEE 46, WISCONSIN

3000-LB. MODELS
LOAD CAPACITY COMPARISON CHART

Capacity Shown Below at 12" off center of Rotation and Distances of Center of Gravity of Load from Table.

Positioner	12"	18"	24"	30"	36"	42"	48"	54"	60"
P&H	**3000**	**2510**	**2160**	**1900**	**1690**	**1520**	**1390**	**1270**	**1180**
A	3000	2000	1500	1200	1000	—	—	—	—
B	3000	2250	1800	1500	—	—	—	—	—
C	2987	2187	1725	1424	1212	1056	935	839	760





I'M SMOOTHARC SCOTTY...and I'm always looking for ways to save money. That's why I like the extra capacity of P&H positioners. Our FREE load-capacity table will show you why.

SEND COUPON TODAY FOR FREE INFORMATION

P&H HARNISCHFEGER CORPORATION
Welding Division
4411 West National Avenue, Milwaukee 46, Wisconsin

Attention: W. R. Stephens, Sales Manager

Please send me your free load-capacity table covering the P&H Positioner line.

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

3099

the **P&H** *Line*

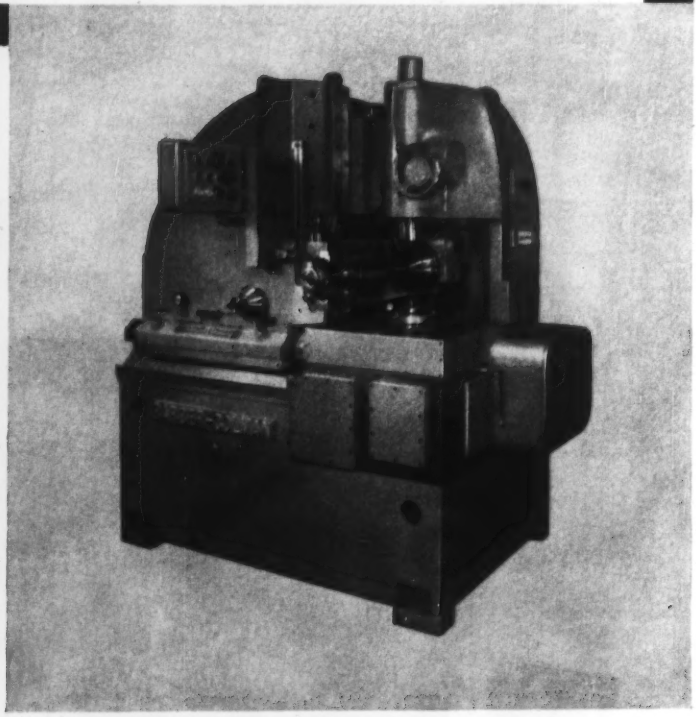
TRUCK CRANES · DIESEL ENGINES · POWER SHOVELS · PRECAST CONCRETE MIXERS · HOISTS · ROD STABILIZERS · WELDING EQUIPMENT · OVERHEAD CRANES

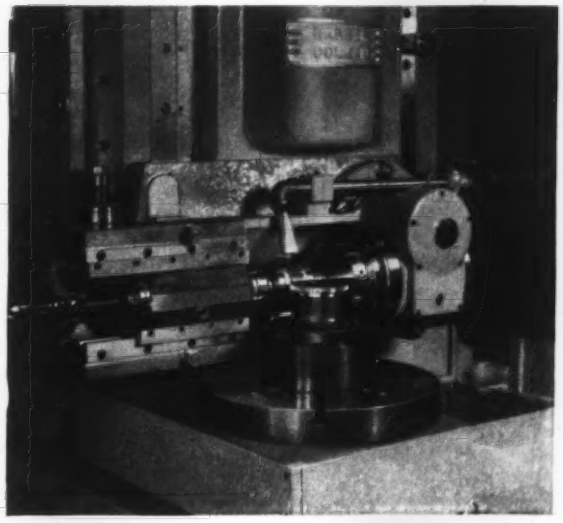
P&H welding equipment is manufactured and sold in Canada by REGENT EQUIPMENT MANUFACTURING COMPANY LTD., 455 King Street West • Toronto, Ontario, Canada

a new concept of gear accuracy!

Barber • Colman Builds World's Most Accurate Hobbing Machine

First hobbing machine ever guaranteed to cut gears within 10 seconds angular error





Barber-Colman has designed and built, in collaboration with Sperry Gyroscope engineers, a new type of hobbing machine which hobs without any further finishing operation, gears for the most accurate radar, navigational and computing equipment. This machine is known as the "Ultracision" Hobbing Machine and is so accurate that gears cut by it will transmit motion within 10 seconds of true angular rotation. This is equivalent to .0001" on 4" diameter, which is the only size that has been thoroughly investigated at the present time. This means that the combination of lead, profile and spacing errors measured over non-adjacent teeth cannot exceed 10 seconds of true angular displacement at any diameter along the involute.

In order to arrive at this degree of precision, it has been necessary to provide new methods of positively checking such accuracy. Sperry engineers utilize theodolites and auto-collimators in conjunction with pneumatic, electronic and mechanical gaging equipment which assures accurate measurement within millionths of an inch.

the machine

To produce gears of this accuracy, many new and unusual features have been incorporated in the hobbing machine. The greatest care in manufacture and assembly has been used for all parts. All vital surfaces on the machine are scraped within .0001" per foot, and even the covers are scraped to fit the scraped portions of the bed casting to prevent entry of foreign matter.

Since the machine is designed to cut only spur gears, the feed drive is independent of the main drive. Capacity of the machine is 10" diameter blanks, 6" maximum length of hob carriage travel, and maximum rated pitch capacity of 32 DP. Drives to the work and hob spindles have been made as short as possible to minimize any twisting and vibration. An extremely accurate index worm and gear are mounted in ultra-precision taper roller bearings. Except for the index change gears, the gear train between the main drive shaft and the index worm contains only a worm and worm gear, and a pair of 90° helical gears.

The basic machine weighs 11,000 lbs., (with controls 13,800 lbs.) to provide the rigidity necessary for this exceptional accuracy. Another feature for increased rigidity and accuracy is the elimination of a hob slide. The hob is mounted directly on an expanding arbor, and shifted on this arbor, rather than by means of a hob slide.

Adjustments are provided for trueing the hob spindle within a few millionths of an inch. Both hob spindle and outboard support are mounted in ultra-precision taper roller bearings.

the hobs

To attain extreme profile accuracy on the gear teeth, Barber-Colman also has developed a new class of hob called "Ultracision", and made to limits of .00008" lead variation in one axial pitch, and .00015" in 3 axial pitches. These limits are just half of those for Class AA hobs. These hobs are ground and have larger than standard diameters to permit a greater number of hob teeth for very fine finish on the gear tooth profiles. Wide hubs and a 2" diameter straight bore provide maximum rigidity for the hob.

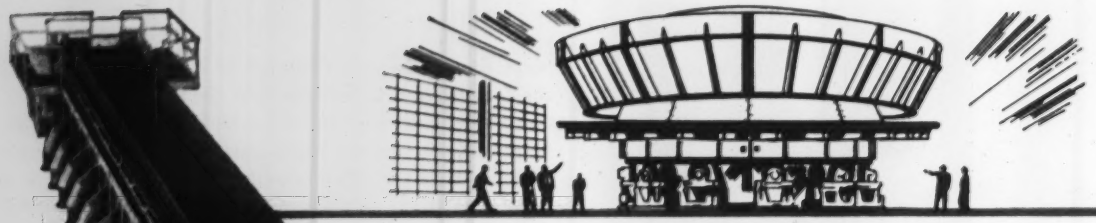
The development of this new concept in gear accuracy — the finest limits of gear accuracy ever obtained on a production basis — will eventually reflect in a higher standard of quality for gears produced on standard production hobbing machines. You are invited to submit your gear specifications and problems for analysis and recommendations by our engineers. Detailed information on the new "Ultracision" Hobbing Machine is available on request.

BARBER-COLMAN COMPANY

6911 ROCK STREET • ROCKFORD, ILLINOIS

Hobs • Cutters • Reamers • Hobbing Machines • Hob Sharpening Machines

BARBER COLMAN



POLLOCK

chosen to construct latest sintering plant equipment

McKee 16 Wind Box Sintering Machine

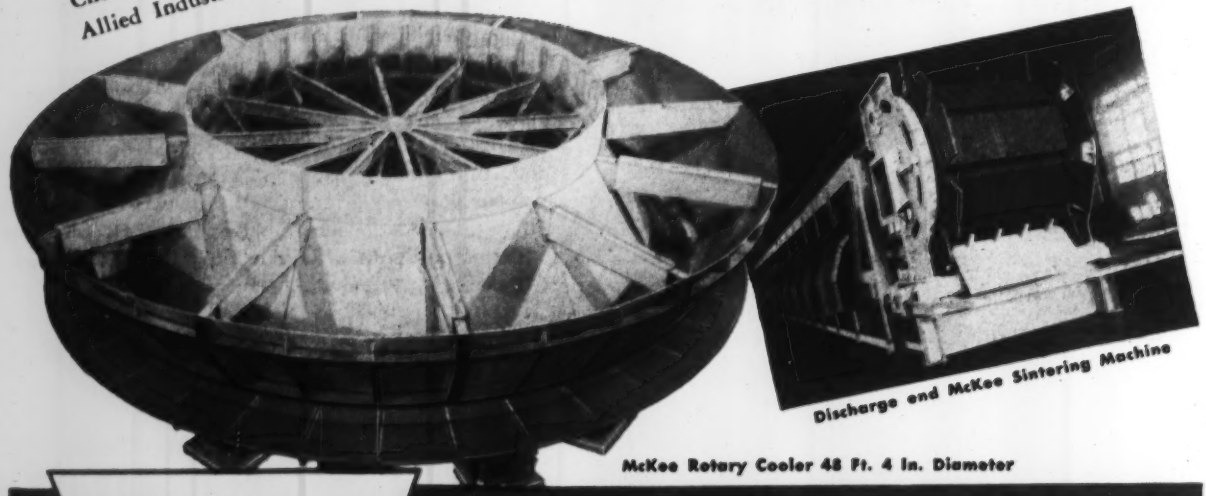
POLLOCK ALSO MAKES . . .

Miscellaneous Welded and Riveted Steel Plate Work for Blast Furnaces and Steel Plants, Oil Refineries, Chemical Plants and Allied Industries.

TO construct its newly developed sintering plant equipment, Cleveland's Arthur G. McKee Company chose The William B. Pollock Company, steel plate construction experts since 1863.

This latest sintering machine and rotary cooler were assembled in Pollock's Youngstown, Ohio plant and inspected by the customer and many interested iron and steel operators and engineers while in test operation. Then it was thoroughly match-marked, disassembled, and loaded on 16 railroad cars in such a way as to insure quick and efficient field erection.

Pollock is known the world over for its reliable, efficient heavy plate construction.



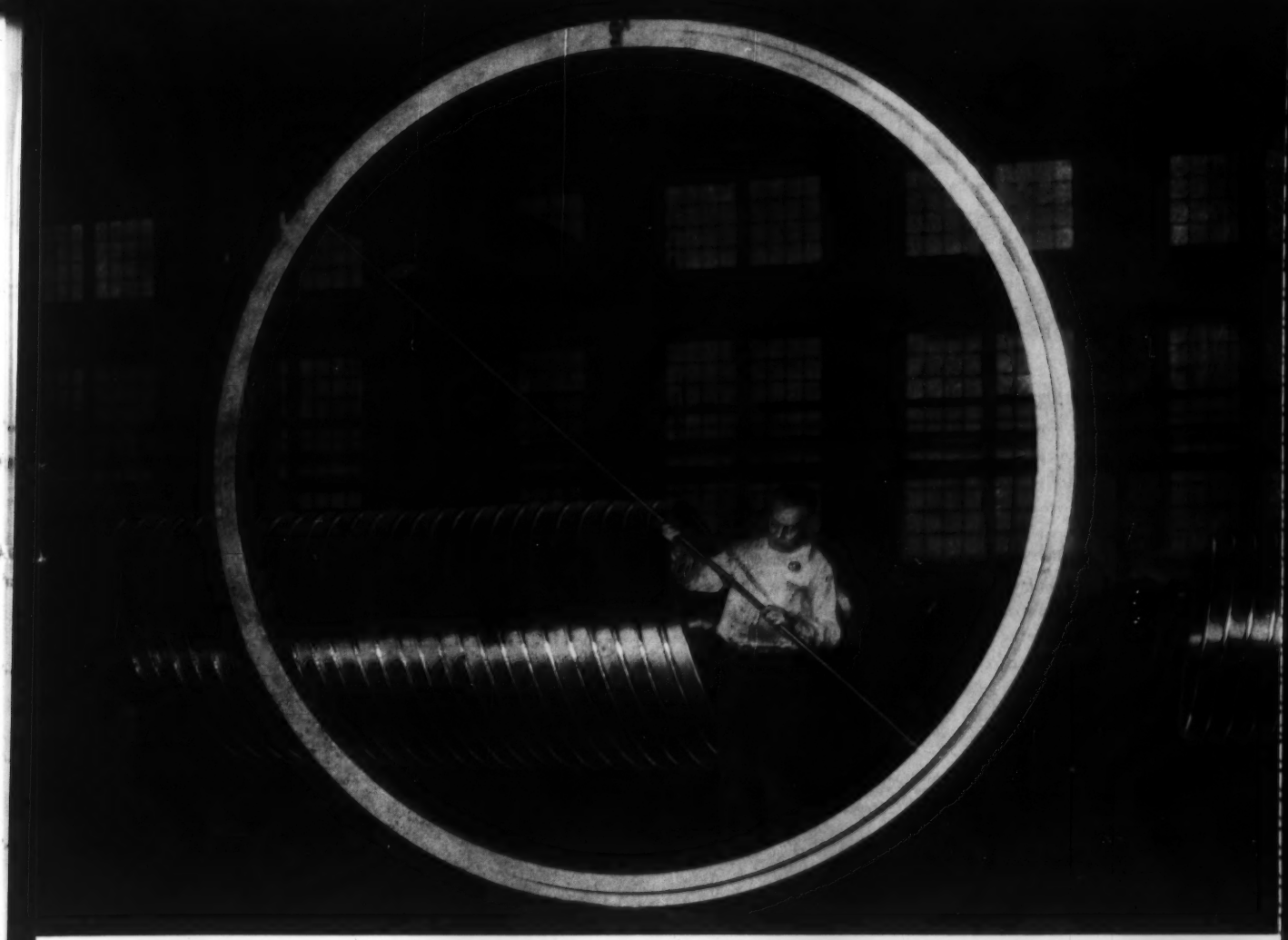
Discharge end McKee Sintering Machine

McKee Rotary Cooler 48 Ft. 4 In. Diameter

POLLOCK

THE WILLIAM B. POLLOCK COMPANY
YOUNGSTOWN • OHIO
STEEL PLATE CONSTRUCTION • ENGINEERS • FABRICATORS • ERECTORS

BLAST FURNACES • HOT METAL CARS AND LADLES • CINDER AND SLAG CARS • INGOT MOULD CARS • CHARGING BOX CARS • WELDED OPEN HEARTH LADLES



you can improve your product, cut costs with Standard Steel forged rings and flanges

Here's why you can be sure of a *quality* product when you specify Standard Steel rings and flanges:

- We produce our own acid open hearth steel, quality-controlling it every step of the way.
- Our rolling practice reflects 60 years of experience. Controlled cooling and subsequent heat treatment assure long service life.
- Finished rings and flanges are carefully inspected to make certain they meet your specifications exactly.

When you specify Standard Steel rings and flanges you cut costs because:

- First costs are often lower.
- Final costs are invariably lower. Pieces are rolled close to final tolerances, so expensive machining time is greatly reduced.
- We offer extra services—rough machining, finish machining, drilling, splitting, parting—that often cost less in our shop than elsewhere.
- You get fast service—no costly delays to your production schedule.

In addition to rings and flanges, Standard Steel Works can furnish you with shafts, wheels, gear blanks and special shapes. Next time you need forgings of any kind, get our quotation first. For your copy of our new bulletin, write Dept. 9546, Standard Steel Works Division, BLH Corporation, Burnham, Pa.

STANDARD STEEL WORKS DIVISION
BALDWIN-LIMA-HAMILTON

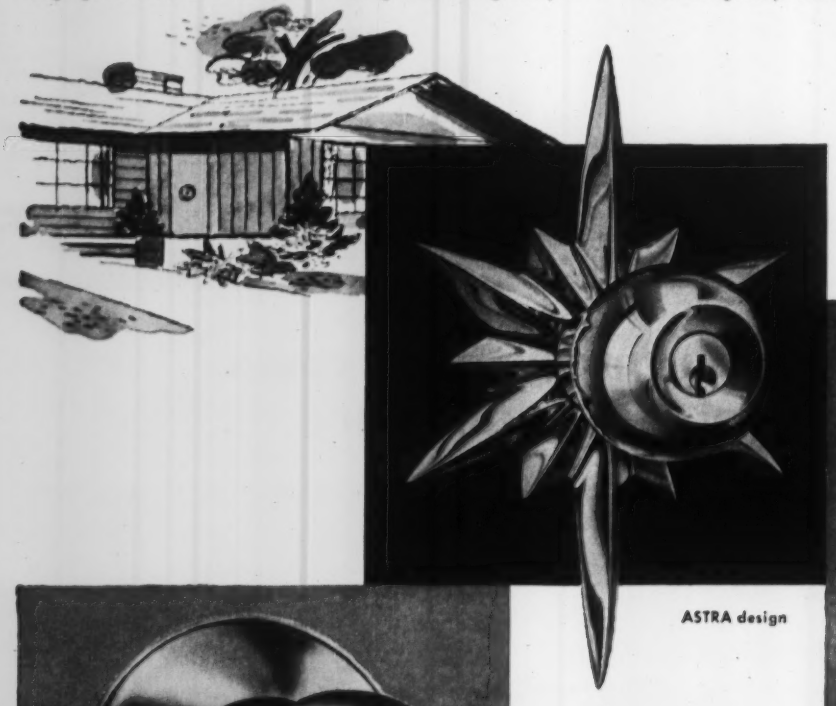
DIVISIONS: Austin-Western • Eddystone • Hamilton • Lima • Electronics & Instrumentation • Madsen • Pelton • Loewy-Hydropress • Standard Steel Works

MUELLER BRASS CO.

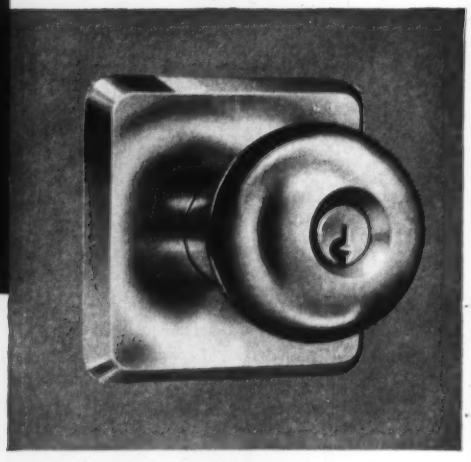
brass and bronze forgings help insure dependability and lasting jewel-like finish of distinctive SCHLAGE locks

Smart styling, handsome appearance and durability have been neatly combined by the Schlage Lock Company of San Francisco in their line of lock designs for residential and commercial use. Many important parts of these lock sets are brass and bronze forgings made by the Mueller Brass Co. The beautiful natural color, corrosion resistance, and inherent dependability of these forgings make them ideal for this purpose. In addition, the high degree of surface smoothness makes possible an exceptionally lustrous finish as well as a perfect plating surface when required. Then, too, the use of forgings has reduced costs, cut finishing time and greatly reduced the number of rejects when compared to the sand castings that were formerly used.

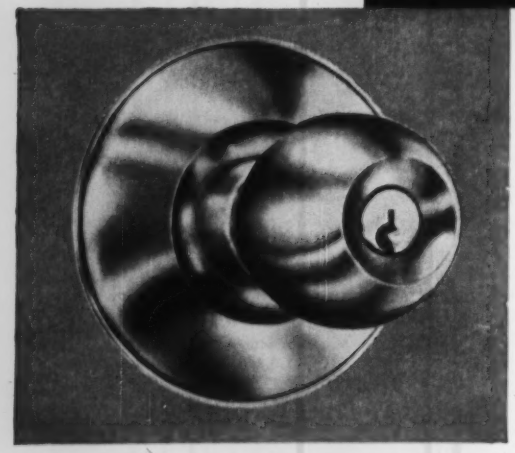
Whether you manufacture decorative hardware where finish is of prime importance or rugged assemblies that must stand up to bruising everyday punishment, it will pay you to investigate Mueller Brass Co. forgings. Strong, long wearing brass, bronze or aluminum parts, forged to your exact specifications under exacting statistical quality control standards can help you reduce costs, improve performance, and give you a better looking product. Write for our engineering manual (No. H-58565) . . . or call in one of our engineers to investigate possible forging applications in your products.



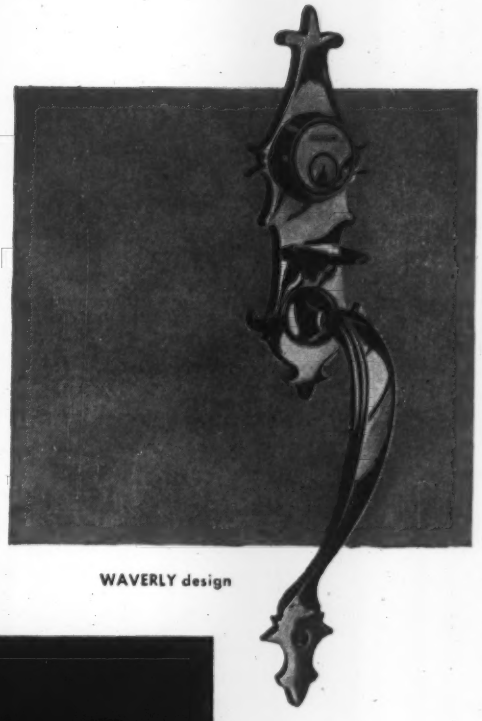
ASTRA design



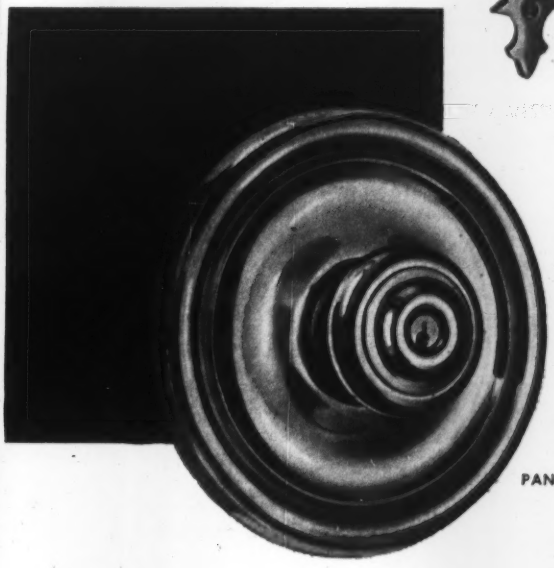
MONARCH design



MERCURY design



WAVERLY design



PANTHEON design

• WRITE TODAY FOR THE ENGINEERING MANUAL YOU NEED

Mueller Brass Co. Forgings
Engineering Manual H-58565 ☐

Tuf Stuf Aluminum Bronze Alloys
Engineering Manual H-58563 ☐

600 Series Bearing Alloys
Engineering Manual FM-3000 ☐

Copper Base Alloys in Rod Form
Engineering Manual FM-3010 ☐

METALS AND ALLOYS REVIEW

by FRANK M. LEVY
Vice-President and Director of Research

Last week one of our sales engineers was at the home office and we were talking about one of his customers in the East who manufactures milling machines which are being used for milling aircraft spars. We are supplying gibs, slide bars and wear strips to this company made of our "600" series bearing metal in rectangular rod form. The material formerly used was aluminum bronze* cast bars which they could only obtain in 36" lengths. Their engineering department estimates that costs have been reduced 50% on this component. Machining time has been reduced and impregnation of porous castings has been eliminated.

Our sales representative was curious about my experience with "600" in other applications such as this. Oddly enough, our own plant has been a pretty good proving ground. In our extrusion department, for example, we have gotten exceptionally good service from slides made of "600" and used on the die heads which are subject to pressure and extremely rough usage.

Bob Irwin of our forging department reports that the "600" strips he has used for lining the ways of our big forging presses have proved far superior to the bronzes which were original equipment. The bronze strips squashed out after protracted running. More important, the "600" strips last 10 times longer before replacement is necessary.

In our copper tube fabricating department we have a lot of automatic equipment for the production of formed tube shapes like tees and ells used in the plumbing industry. On one of the tube benders, there was no provision made for replacing worn forming slides. Our Maintenance Department reworked the machine using "600" strips as replaceable forming slide inserts. The bender is now a far more efficient machine. Because of the long life of "600", downtime on this machine has been practically eliminated.

While we were talking about these uses in our own plant, it brought to mind some other instances where the exceptionally good wearing properties of "600" have been established. A Cincinnati lathe manufacturer uses "600" in the form of counter sunk hex-headed screws on wearing strips used on lathe carriages. When the strip wears to the retaining screw the ways will not be scratched.

According to their own records, all other materials which they had tested proved unsatisfactory for the job. Another maker of precision lathes and milling machines found that after a year of exhaustive tests, the "600" metal that was used as nuts on compound slide screws outlasted competitive metals at an approximate ratio of 3 to 1 at an estimated saving of 30%.

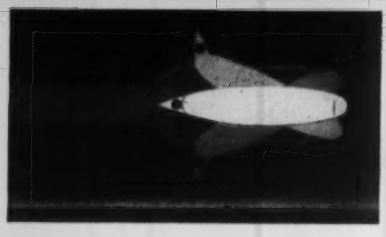
Sliding surfaces on all kinds of machinery have different wear characteristics, as you have undoubtedly found. If you have any problems involving gibs, slide bars or wear strips that are proving troublesome, why not drop me a line or send a part print and we'll be glad to study it and make the proper recommendations.

**We manufacture 4 grades of wrought aluminum bronze.*

MUELLER BRASS CO.

PORT HURON 19, MICHIGAN

185



Reduces ship roll up to 90% — First commercial installations of the Sperry Gyrofin are on the Matson liners, *Mariposa* and *Monterey*. The design calls for strong, corrosion-resisting Inco Nickel Alloys at key locations: "K" Monel hinge pin . . . Monel nickel-copper alloy spacer rings . . . Monel overlay (welded with "140"* Monel Electrode) on flap control surfaces.

Sketch at left shows the tilting range of the underwater fins that keep a ship steady. One fin extends from each side of the hull amidships.

"K" Monel allows sea water lubrication in new Sperry-designed Gyrofin

See the flap on the fin above?

It's a key part of the Sperry Gyrofin® Ship Stabilizer, a new invention to keep ships steady in heavy seas.

Designing the flap hinge posed two problems for Sperry engineers.

First . . . high strength. A hinge pin was needed that could take its full share of *3,000 foot-tons* of anti-rolling moment.

Second . . . positive lubrication. Almost instantaneous response to computer instructions is required . . . fin (and flap) sometimes change direction *every two seconds*. But how could the hinge area be sealed off and lubricant supplied?

A "K" Monel age-hardenable nickel-copper alloy hinge pin *solved* Sperry's first problem . . . *by-passed* the second.

This rod, 4½-in. dia. by 15 ft. long is strong enough to hold the flap firmly in position as it withstands the battering force of ship and sea. And the exceptional corrosion resistance of "K" Monel permits use of *sea water* as a lubricant...eliminates the need for a sealed hinge!

Designing parts for operation in corrosive media?

Or for other destructive service conditions? Investigate the Inco Nickel Alloys. Their properties and applications are described for designers in a helpful booklet . . . "Standard Alloys for Special Problems." A postcard brings your copy.

The International Nickel Company, Inc.
67 Wall Street New York 5, N. Y.

INCO TRADE MARK **NICKEL ALLOYS**

Monel* • "R"* Monel • "K"* Monel • "KR"* Monel • "S"* Monel
Inconel* • Inconel "X"* • Inconel "W"* • Incoloy* • Incoloy "T"*
Ni-o-nel • Nimonic* Alloys • Nickel • Low Carbon Nickel • Duranickel*

*Trademark of The International Nickel Company, Inc.

STEEL

Metalworking Outlook

November 12, 1956

Coalition at Work

Look for the Republican-Democratic coalition in Washington to work in reasonable accord for the next two years, just as it has in the last 24 months. Here's a sample of general agreement on a couple of business-generating programs: 1. Eisenhower Republicans and many Democrats in Congress will vote for the administration's $2-billion federal aid to school construction and will put it on a four-year basis, rather than five years as originally planned. 2. Chances appear good for the expansion of the 40,000-mile, $26-billion federal highway plan to a 52,000-mile, $32-billion program in the next Congress.

The Suez and British Steel

Extended closing of the Suez canal would seriously hamper Britain's steel operations. The closing restricts the movement of iron ore to Britain and iron and steel products being shipped to the Middle and Far East. Since British steel is the nation's largest consumer of oil, cutbacks in that fuel will hamper steel production.

Expansion Abroad

American companies aren't the only ones spending heavily for capital improvement. The European Community for Coal & Steel reports that coal and steel firms in West Germany, Belgium, Luxembourg, Holland, France and Italy will put $1 billion into capital expenditures this year—compared with $969 million in 1955 and $976 million in 1953, the previous high. A look at the investment total over the last three years shows steel accounted for 51 per cent, hard coal 45 per cent and iron ore mines, lignite-briquette works and lignite-coking plants the remaining 4 per cent.

Prospects for Uranium

Uranium may be on the open market by 1960, believes Arthur D. Little Inc., the Cambridge, Mass., research and engineering organization. The U.S. has little pressing need for uranium for civilian uses, since domestic energy resources are extensive. A large market is expected to develop rapidly in fuel-short nations. U.S. uranium mining and milling output will probably exceed domestic demand until 1968. Known economically recoverable uranium reserves of the Free World are estimated as the equivalent of 500 million to 1 billion tons of 0.2 per cent ore. Today, the U.S. mines 3 million tons of uranium ore annually, will mine 5 million or 6 million by 1958. More than 900 mines operate in the U.S.

Labor Force: 90 Million by 1975

Watch for the average annual labor force in the U.S. to hit about 90 million persons by 1975. In 1955, the average was 68.9 million, reports the Bureau of the Census. By 1975, predicts the bureau, 41 per cent of the

Technical Outlook—p. 129 Market Outlook—p. 177

married women in the country will be in the labor force, compared with only 29 per cent last year.

Working Wives

That number of working wives raises these questions in many observers' minds: Is the 35-hour or four-day week an urgent issue? Doesn't the steadily growing number of women in the work force indicate that families want more money, but not more leisure each week? Some industrial relations people think that management can satisfy the need for leisure by employees more satisfactorily by longer vacations, not shorter hours.

Never Had It So Good

The average U.S. production worker doesn't have to labor as long as he did five years ago to buy most key consumer items, says the National Industrial Conference Board. The board finds that in August, 1956, 12 of 16 goods and services cost less in terms of hours of labor than they did in August, 1951. Declines ranged from 4 per cent for a movie admission to 42 per cent for a pair of nylon stockings.

What's Ahead for Aluminum

I. W. Wilson, president, Aluminum Co. of America, cites these facts as indicative of the aluminum industry's healthy position: 1. Domestic production has increased tenfold since 1939. 2. U.S. per capita consumption has grown from 3 lb to some 24 lb. 3. Supply is temporarily adequate for demand. 4. Demand next year will be greater than it is this year. 5. Total U.S. aluminum supply, including domestic production, imports and secondary recovery, will be about 3 million tons by 1958. 6. U.S. consumption should exceed 3 million tons by 1960, may rise to 5 million tons by 1975.

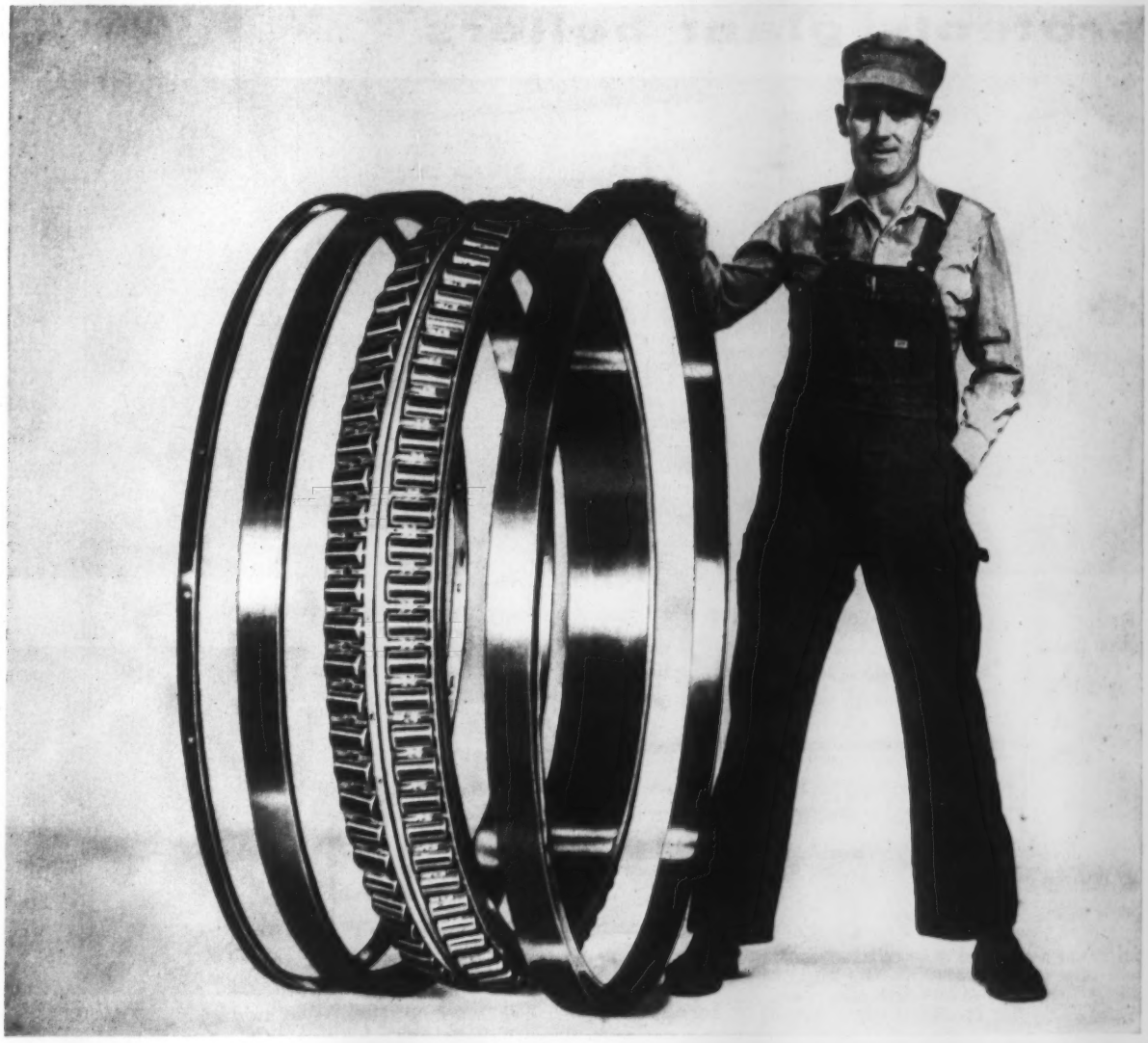
Ore Season: Record Length?

The current Great Lakes ore shipping season may be the longest on record. Reasons: The need for ore, unusually mild weather and the rising proportion of taconite shipments. A major factor in determining when the season closes is how much the ore freezes, a problem which is minimized with processed taconite pellets. Weather permitting, the shipping season this year could run to Dec. 12 for vessel operators whose insurance expires on that date, and even longer for those who are self-insured.

Straws in the Wind

The American Institute of Steel Construction says new contracts for fabricated structural steel in September continued to slip for the fifth consecutive month . . . U.S. industry spent more than $700 million last year for welding equipment, supplies and gases, says the Small Business Administration . . . In ten years, American industry can expect to double its present maintenance expenditure of $11 billion annually, predicts General Electric Co. . . . Some 200,000 tons more of aluminum will be made available to industry in 1957's first half because the U.S. will defer stockpiling for that period; similar deferrals will reach 400,000 tons in 1956.

TORRINGTON *CUSTOM-MADE* BEARINGS



"This 63" bearing was custom-made for us—by TORRINGTON!"

Building custom bearings for industry is a Torrington specialty. Whatever the anti-friction assignment—Torrington can design and build the bearing for the job.

When you specify a Torrington job-designed bearing, you're calling on engineers with extensive experience in custom-bearing applications. Torrington will survey your needs, recommend and design the right bearing to provide peak efficiency, economy and service life.

For *any* standard or custom bearing, backed by broad manufacturing and design experience—specify TORRINGTON.

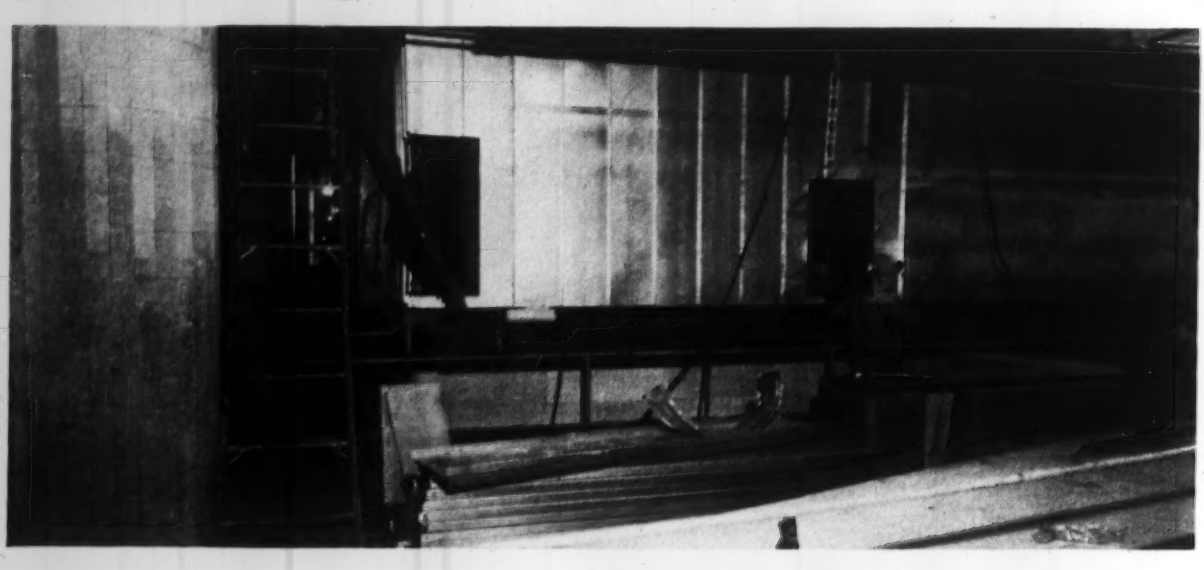
THE TORRINGTON COMPANY
South Bend 21, Ind. • Torrington, Conn.
District offices and distributors in principal cities of United States and Canada

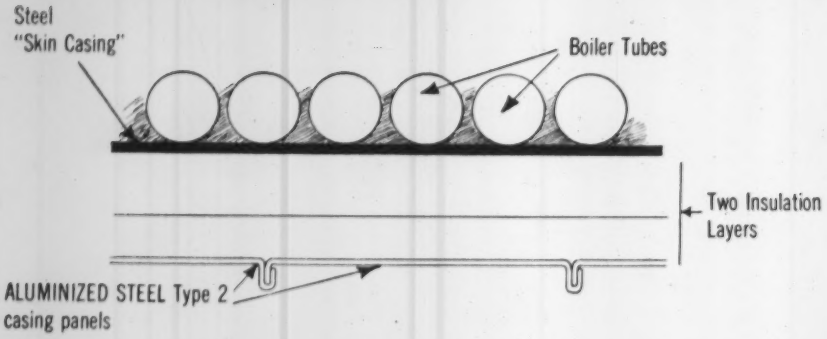
90th ANNIVERSARY 1865-1955

TORRINGTON BEARINGS

Spherical Roller • Tapered Roller • Cylindrical Roller
Needle • Ball • Needle Rollers

New Armco ALUMINIZED STEEL Type 2 protects giant boilers





Interlocking panels made of Armco ALUMINIZED STEEL Type 2 make up an easily-erected, low maintenance outer covering for this boiler. Between this covering and the sheet metal "skin casings" next to boiler tubes are two layers of insulation.

Casings for the big boilers and duct work at Detroit Edison's River Rouge Power Plant must be damage-resistant and easy to maintain. That's why Armco ALUMINIZED STEEL® Type 2 was specified for these casing panels.

Maintenance men at the plant say non-metallic casings are more easily damaged and create "housekeeping" problems in installation and maintenance. In contrast, strong, easily-erected panels of Armco ALUMINIZED STEEL Type 2 not only resist damage but stay attractive with little or no upkeep. The patented hot-dip aluminum coating on this special steel resists corrosion—makes painting unnecessary.

what 17-year tests show

Seventeen years of testing in an industrial atmosphere show this about the corrosion resistance of Armco ALUMINIZED STEEL Type 2: *The life of the aluminum coating in atmospheric service is at least three times that of a standard zinc coating on galvanized steel sheets.* (The steel was tested 15 years before it was produced commercially.)

Wherever you need a sheet steel for atmospheric service, it will pay you to consider ALUMINIZED STEEL Type 2. For more information about this newest Armco Special-Purpose Steel, just write us at the address below.

ARMCO STEEL CORPORATION

2446 Curtis Street, Middletown, Ohio

Sheffield Steel Division • Armco Drainage & Metal Products, Inc. • The Armco International Corporation

After the Election: What?

The big turnout at the polls last Tuesday is ample evidence of the kind of government the American people want in the next four years and what they expect from that government.

Let us enumerate some of the factors that will affect you as an individual and your business:

You can expect no sharp deviations in the Eisenhower policy.

In dealing with Congress, you can expect the President to emphasize social legislation.

He will ask for a broadening of the minimum wage law to apply to more workers. Revisions in the Taft-Hartley Act will be sought to make it more effective.

He will ask Congress for federal assistance to school construction.

Aid for small business, including tax relief, will be part of his program.

You can expect the President to carry on his belief in efficient and solvent government. He may ask for another big tax reduction bill—but probably not in 1957. Any cut in taxes will come from increased federal income, not from a reduction in spending.

Military strength will be increased and advanced technologically as a means of deterring aggression. The trend in defense spending necessarily will be upward.

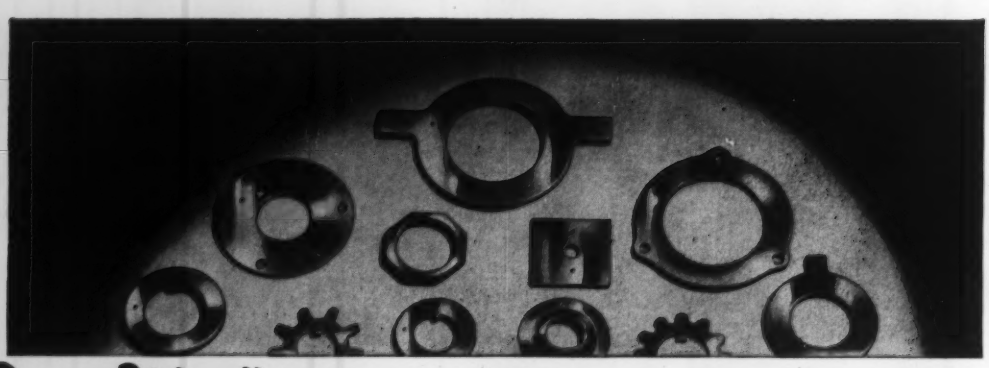
The present hard money policy will be continued to preserve the value of the dollar. Don't be surprised if the Federal Reserve discount rate moves up a quarter or a half point from 3 per cent. It means high-cost mortgage money for housing. Even so, almost 1 million new housing units will be started in 1957. Inventory and expansion loans will still be easy to get. The boom in new industrial and commercial building will continue. Machine tool builders meeting in Chicago last week expected shipments of $1 billion annually in the foreseeable future, three times the 1950 rate.

As a measure of activity in the metalworking industry, steel ingot production in 1957 will set a record of 120 million tons, even though the industry operates at no more than 90 to 91 per cent of capacity.

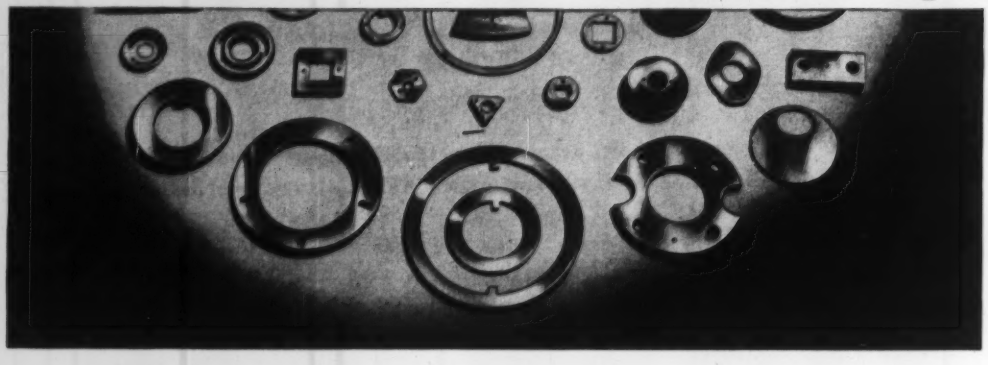
How will business be after the election?

It will be excellent.

Irwin H. Such
EDITOR-IN-CHIEF



"Quality" is an Important Word in the Purchase of WASHERS, too



Never before has Industry, as a whole, been more conscious of Product Quality than in today's competitive market. In the final analysis, no piece of equipment is any better than its smallest, least noticed components, such as WASHERS... essential to secure, permanent *fastening* and *holding* of vital parts.

In the manufacture of Milwaukee Wrot Washers, *uniform high quality* is a production policy that is strictly adhered to and maintained... and yet does not involve a cost penalty to the purchaser. You get the best the market offers, competitively priced, plus assurance of a dependable source of supply... when you specify "MILWAUKEE WROT WASHERS"... standard and special washers of every description, in all sizes, with over 100,000 sets of dies available to meet your specifications.

Send us your specifications and let us quote on your requirements for washers and stampings of every kind.

Write for New Catalog No. 40.

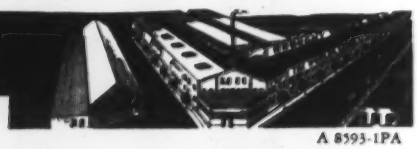
MILWAUKEE
WROT WASHERS

SINCE
1887

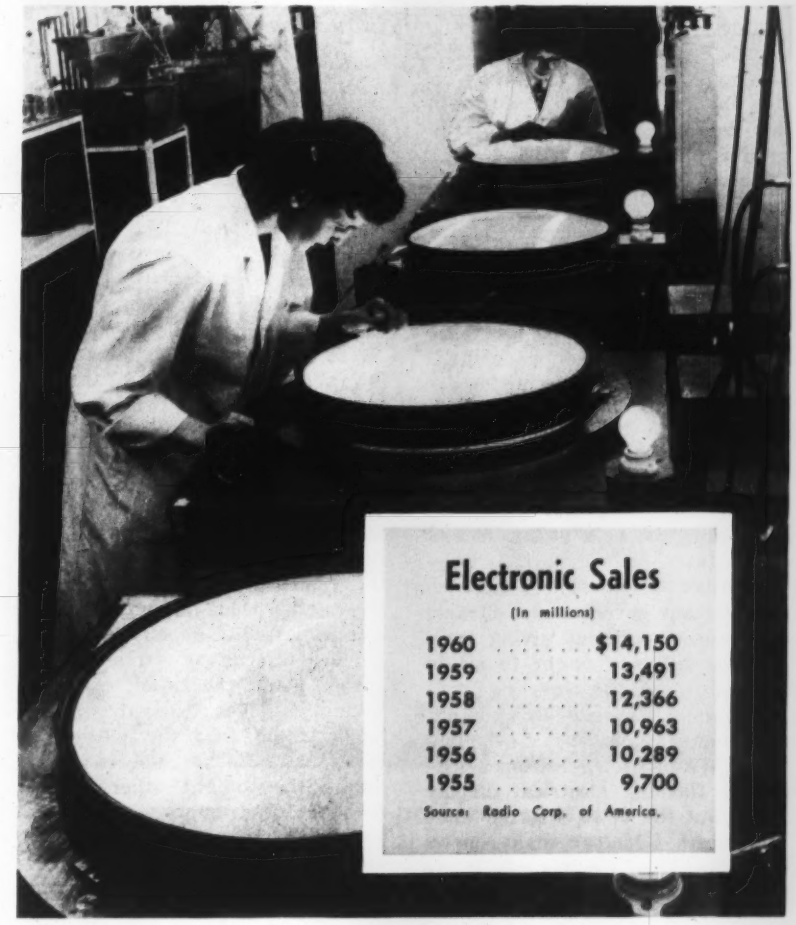
WROUGHT WASHER MFG. CO.

THE WORLD'S LARGEST PRODUCER OF WASHERS

2103 SOUTH BAY STREET • MILWAUKEE 7, WISCONSIN



A 8593-1PA



Electronics Blasts Off

The "growth industry of the decade" is ten times larger than it was at the end of World War II. Look for sales of $20 billion plus in this field in ten years

TOP executives in the electronic industry look at annual sales figures that hit the $10-billion-plus mark, listen politely to predictions of double that in ten years, then snort, "conservative!"

Notes Frank M. Folsom, president, Radio Corp. of America: "In 1955, 80 per cent of RCA's total sales ($1.1 billion) were in new products and services which did not exist or were not commercially developed ten years ago (when RCA sales were $237 million)." He expects a similar pattern of development in the next decade.

Zoom!—Growth rates of some future products will be phenomenal if present hot shots are any indication. Sales of closed circuit industrial television, for example, are about $6 million this year, will grow to about $24 million by 1960. Transistors, barely beyond the curiosity stage two years ago, tallied $19.7 million in sales in the first eight months of this year. Some 7 million units were turned out, compared with 1.7 million, worth $6.4 million, in the same 1955 period.

Such statistics add strength to optimistic company forecasts for 1957. Says the Stromberg-Carlson Division of General Dynamics Corp.: "Our 1956 sales will be about 24 per cent above 1955's; we expect a 30 per cent increase in 1957 over 1956."

Color TV—Good business in electronics spreads out into other metalworking areas. Check color TV, which some sources say is finally off the ground. Several estimators say 10 million color sets will be in U.S. homes by the end of 1959. They will require: 175,000 tons of steel, 5000 tons of brass, 3500 tons of solder, 3000 tons of copper, 2500 tons of zinc.

For the 2000 parts that go into its 21-in. set, RCA buys from 600 suppliers in 43 states. Of $35 million in defense contracts recently awarded to Raytheon Mfg. Co., some $6 million will go for plant preparation and tooling up.

A representative list of equipment purchased by the electronics industry includes punch presses, drill presses, milling machines, gear hobbers and grinders, heat treating and annealing furnaces, plastic molding machines, finishing equipment and cablemaking machinery.

The industry will be buying increasing amounts of automatic assembly and processing equipment.

Strange Partners—In its rapid growth, electronics has traveled far afield from its beginnings in communications. Take the DuMont Enginscope, an electronic engine analyzer developed by Allen B. DuMont Laboratories Inc. Raytheon Mfg. Co. has its microwave cooking oven in the cabinets of several appliance manufacturers. The Bureau of Mines is working on electronic methods of testing the safety of mine roofs.

Other developments: Electronic air conditioners and refrigerators with no moving parts and a light amplifier for industrial x-rays which gives an image 100 times brighter than the conventional fluoroscopic screen. (Dr. E. W. Engstrom, senior vice president at RCA, says the amplifier opens the

way to far greater speed, efficiency and accuracy in the vital field of industrial inspection.)

Another development is Electrofax: RCA claims it will enlarge, develop and print 15 standard-size engineering drawings a minute from microfilm originals. Developed for the Navy, the Bureau of Aeronautics estimates the system's potential savings (for the bureau) will exceed $1 million annually in lowered procurement, reproduction and storage costs.

Industry is a big and growing customer for electronics. The Radio-Electronics-Television Manufacturers Association states: "During the next ten years, the rate of growth in industrial electronics will exceed that of consumer electronics during the last decade."

By 1960, industrial electronic sales will be $1.2 billion; by 1965, $2 billion—compared with $700 million in 1955.

Uncle Sam — The military will continue to be a big user of electronics. Present volume is about $3 billion. Major products wanted in greater numbers: Missile test and check-out instruments, data processing equipment, flight simulators and radar (especially in low and superhigh frequencies).

The military is also asking for miniaturization, increased reliability, easier operation and easier maintenance (built-in test and check-out equipment and unit replacement). With electronics getting more complex, those requirements are tough on designers, but as one executive puts it: "If they didn't ask for the impossible, we'd progress a lot slower than we do."

Military developments often lead to commercial applications. Kaiser Electronics, for example, is working on a flat TV tube for the Navy that will allow a fighter pilot to "see" up, down and to the sides as well as ahead. If it works out, the tube could result in wall-hung TV screens, 4 x 6 ft, or even larger.

Problems—In spite of booming business, the electronic industry has its problems. Competition—for personnel and customers—is the chief one. Prices and distribution are two more. Comments B. F. Gira, president, Topp Industries Inc.: "The glamour of electronics is being replaced by business." But he figures his own firm is ready for such a climate and will more than double 1956's $3-million volume by 1958.

"Competition in our industry is intense," states another member. Several TV set makers have pulled out, though many small firms in the development and component making phases are doing well.

Hard Bargains — Government purchasing agents are bargaining hard, and competition is tight for research and development and production contracts. Few will take a research contract at a loss in hopes of gaining an inside track on the production job; a competitor may underbid. Competition for "second source" contracts is also spirited and makes for rough competition for the original producer who must keep his costs at least as low as the second source or risk losing the bulk of subsequent contracts.

Industry comment: "Congressmen who say government contracts are awarded without giving competition full play ought to sit in my seat for a week or two."

Engineers Wanted—Sign of another industry problem: In the lobby of Washington's National Airport a flashing electrical display blinks out the news, weather and: "Engineers — Melpar makes news in the world of electronics. While in Washington, check unique career opportunities at Melpar. Inspect new ultramodern facilities. Phone JE 4-5059 to arrange free transportation to Melpar Laboratories."

Many firms are being squeezed by the shortage of engineers. In some cases, it's holding back business expansions. Shortages of management, supervisory and distribution personnel are also showing up, as is a pinch on technicians. General Electric Co.'s W. L. Parkinson says: "The availability of trained technicians required to install, maintain and service electronic products may, in fact, determine the progress of electronics." Under way are RETMA courses to upgrade technicians and help trade and vocational schools give better instruction.

How Big?—Estimates vary on how many companies are in the electronics business. Some sources say about 3500. Yet RCA alone buys material and services from some 7500 firms.

Adding to the difficulties of pegging the industry's size is the constant formation of new companies, mergers and the setting up of electronics divisions by companies in other lines. It's a rare aircraft company now that doesn't have an electronics division. Some electronics executives, though disturbed about the trend, say half-jokingly: "The aircraft people were forced into the electronics business because they became afraid they might otherwise become subcontractors — that the prime contract would cover the electronics systems and the airframe builder would get only the subcontract to put wings on them."

But problems or no, the electronics industry is optimistic. As Melpar's A. C. Weid puts it: "We're still only on the threshold of the electronics age."

A Changing Product Mix for Electronics

(Millions of dollars)

	1956	% of total	1960	% of total
Black & white TV	$1,566	15.2	$ 549	3.9
Color TV	182	1.8	1,870	13.2
Radio-phonograph	938	9.1	943	6.7
Records	212	2.1	324	2.3
Commercial	789	7.7	1,337	9.4
Government	2,484	24.1	3,129	22.1
Service, installation	2,780	27.0	4,009	28.3
Broadcasting	1,338	13.0	1,989	14.1
Total	$10,289	100.0	$14,150	100.0

Source: Radio Corp. of America.

Gregory Expands Division

Gregory Industries Inc., Toledo, O., will expand the manufacturing and engineering facilities of its Nelson Stud Welding Division plant at Lorain, O., by 30 per cent.

Maurice A. Enright, vice president of planning, says construction of the 15,000 sq-ft addition will start as soon as possible. New production equipment is to be delivered next year.

The federal government's $33-billion highway program, says Gregory's president, George E. Gregory, is expected to add to the demand for the company's stud welding equipment and flux-filled studs.

Excessive paper work, other problems revealed in . . .

Progress Report on SUB

AS MOST SUB programs swing into operation this fall, management administrators are crossing their fingers: "Let's hope it runs smoothly."

For a year, they've had the herculean task of getting set for the magic date when laid-off employees became eligible for Supplemental Unemployment Benefits—last June for the auto firms, September for the farm implement makers, October for many suppliers of these industries.

Here is a summary of what has been learned so far:

Enough Money—1. Trust funds appear adequate. Funds average about 33 per cent of maximum. In September, Ford Motor Co.'s fund totaled about $18 million; Allis-Chalmers Mfg. Co.'s, about $2.4 million; International Harvester Co.'s, about $3.5 million; and Caterpillar Tractor Co.'s, about $2 million.

2. SUB checks have been lower than most workers expected. At Ford, payments averaged $14.50 a week in the first four-week benefit period and $8.73 a week in the weeks following. Laid-off employees at Caterpillar Tractor Co. averaged $16.12 in their first week. Added to these figures, of course, are the state unemployment compensation payments.

3. There have been few worker appeals, indicating a fairly smooth operation as far as mechanics of the program go.

Too Complicated—Any over-all analysis of the SUB program would be premature. But comments from management are not too difficult to come by. They suggest directions SUB may take when negotiation time rolls around again.

Biggest complaint: SUB is too complicated, too hard to administer. Even though costs are paid from the SUB fund itself, the program puts an added burden on statistical and personnel people.

"We tried to make administration as simple as possible," Allis-Chalmers' officials relate. "We had good co-operation from the union, but we still wound up with 16 forms required to administer the program." A medium-size Chicago metalworker whose payments begin this month is still trying to reduce the number of forms below 20.

Expect a full evaluation of administrative costs to be revealed next spring.

Another headache: Some states —Ohio and Indiana are two—still don't permit integration of SUB with state unemployment compensation. Auto SUB has a substitute plan of alternating between state unemployment compensation and SUB payments, but it has disadvantages—administration and more rapid depletion of worker credit units. More acceptable, but still untried, is the Allis-Chalmers provision which permits drawing SUB in a lump sum after UC expires or the worker returns to work.

Ford Vs. Glass — One midwest auto part supplier whose plants include both Ford-type SUB and glass-type vested programs would "like to toss out the Ford-type because it has been a nightmare to administer, compared with the vested plan." The vested, or "income security plans," don't require integration with state unemployment compensation, have no maximum funding and credit unit compilations. Eaton Mfg. Co., another firm which has both programs, says the administrative costs of its vested program have been about half those of its SUB program.

Clark Equipment Co. and Euclid Division of General Motors Corp. report that less than 10 per cent of eligible employees have withdrawn benefits from their vested accounts during layoffs. Workers tend to regard vested accounts as personal savings which shouldn't be dipped into unless necessary.

Recent tax rulings have given the vested programs additional at-

traction: 1. Payments into these plans are not considered taxable income. 2. Withdrawals shall be treated as capital gains.

Rumblings among high-seniority and skilled workers against the Ford-type plan continue. Except during a severe depression period, they stand little chance of getting any benefit from the 5 cents per going into the fund; under a vested program, they would actually realize the money.

Combination — When preparations were under way for the big steel negotiations last spring (STEEL, Mar. 19, p. 45), studies were conducted on the possibility of combining a Ford, or insurance type, SUB with a vested, or income security type, plan.

One Detroit labor observer reports such merger possibilities are being studied by union officials. Several industrial relations executives see advantages in such a plan for management, too. Observed one metalworker: "Such a combination may be the natural evolution of the SUB movement. A comparison of the two plans in action over the next 18 months may provide the clue."

Union Goals — Detroit United Autoworker officials report that they are satisfied with SUB as negotiated—the principle has been established; now they can work from there.

In 1958 they will seek bigger benefits over a longer period, and a hike in contributions.

Experience at Chrysler Corp. indicates that even under the present 5 cent per hour contribution, benefits could be increased. On Aug. 1, Chrysler's general trust fund was 25.12 per cent of maximum. During August and September, $1,145,519 was paid out in benefits; despite this drain the fund's position on Oct. 1 was 24.77 per cent.

Superior Tube Ups Capacity

Superior Tube Co., Norristown, Pa., will boost its production of small tubing and electronic parts in Wapakoneta, O., by 30 per cent with a 63,000 sq-ft building scheduled for completion this month.

New equipment includes draw benches for tubing and an annealing furnace for high-temperature alloys and stainless steels.

Where Aluminum Castings Go

PERMANENT MOLD			SAND	
Per cent of shipments for six-month periods ended:				
June 30, 1956	Dec. 31, 1955		June 30, 1956	Dec. 31, 1955
6.2	4.9	Mining, construction & agriculture	7.6	5.6
67.7	72.8	Motor vehicles	17.5	26.7
2.2	3.3	Miscellaneous transportation	14.6	11.1
7.5	5.2	Industrial & commercial machines, equipment & tools	26.9	22.6
0.6	0.5	Photographic, optical, scientific instrument & equipment	7.7	4.4
12.8	9.9	Home appliances, furnishings, equipment	0.9	1.0
1.4	1.6	Other	4.6	6.4
1.6	1.8	National defense	20.2	22.2
100%	100%	Total	100%	100%

Source: Aluminum Association.

Aluminum Castings Falter

SHIPMENTS of aluminum castings are falling behind their record-breaking pace of last year. Lagging automotive sales have more than counterbalanced healthy increases the industry has picked up in other lines.

Biggest Change—Many permanent mold foundries have had tough sledding this year because of their heavy dependence on the auto industry. Bureau of Census figures for the first eight months of this year show 165 million lb of castings shipped, compared with 198 million shipped in the similar period of 1955.

Total shipments last year were nearly 300 million lb. Charles A. Evans, assistant product manager for casting sales, Aluminum Co. of America, Cleveland, predicts 1960 will top the 1955 record by 60 million lb.

General business conditions have enabled sand foundries to hang on to their sales mark of last year and add a little to it. The Bureau of Census shows shipments are about 3 per cent ahead of last year's. But predictions are that the nation's 2500 aluminum sand foundries will have little additional business to share in the years ahead. Only increased national defense needs are likely to change this outlook.

Diecastings — Although government figures indicate diecasting shipments are about 5 per cent

ahead of last year's, the American Die Casting Institute puts production at 332 million lb this year —about 5.5 per cent under 1955's record.

Next year, predicts the institute, aluminum diecasting production will set a record of 372 million lb. The institute estimates automotive production next year at 6.5 million cars, which, it says, will boost use of diecastings 24 million lb. Non-automotive uses are expected to increase 16 million lb.

A Problem—The increasing tendency of auto makers to produce their own parts may hurt some companies, although markets for diecasters and permanent mold foundries will continue to grow.

In 1948, for every 4.4 lb of aluminum diecastings made in jobbing plants, 1 lb was made in captive shops. Now only 2.3 lb are made by jobbing companies for every pound cast in captive shops. Permanent mold foundries give an indication of this same trend.

Future — R. E. Day, president, Aluminum Alloys Corp., Detroit, says: "We thing sales next year will be much better than this year's." He expects the auto industry to make increased use of die and permanent mold castings. A growing market will be in fuel injection parts.

Aluminum Co. of America, Pittsburgh, points out that ten years ago the only automotive use of aluminum was in pistons (12 lb per car). Last year, average use was 35 lb per car. Future sales, says Alcoa, look good.

J&L To Get Automatic Mill

The steel industry will soon have its first card-programmed roughing mill, says A. C. Monteith, vice president, apparatus products, Westinghouse Electric Corp. His firm will put $1.5-million worth of electrical equipment on the unit—it'll be installed at Jones & Laughlin Steel Corp.'s Aliquippa, Pa., Works. The 6000-hp universal reversing roughing mill will feed a 6-stand, continuous hot strip mill.

"The application of transistors (to the memory unit) also represents a first in steel mill practices," adds Mr. Monteith. The mill is scheduled to be in operation early next year.

Gray Iron Users Speak Up

- **"Piece price definitely easier for costing purposes."**
- **"Foundry's best opportunity to obtain new business is design or redesign assistance."**
- **"Great improvement could be made in appearance and quality."**
- **"Would like to see small users treated like customers rather than pests."**
- **"More scientific controls are needed."**
- **"Improve uniformity of castings to improve automatic machining."**
- **"You need more sales engineers or troubleshooters in the field."**
- **"Delivery—when a promise is made, keep it. Failure to do so is hard on the purchasing agent's nerves and costly to his company."**

A survey by the Gray Iron Founders' Society reveals how this industry can help its customers. Buyers stress importance of quality. Price is secondary consideration

BUYERS of gray iron castings prefer quality over price almost two to one. Two other items (service and delivery) are preferred over price if you lump them into one category.

Both points are borne out in a survey conducted by the Gray Iron Founders' Society to find out how members of the industry can better help their customers.

Purchasing agents were asked to rank these items in one, two, three order of importance: Delivery, engineering help, price, quality and service. Giving first place a weight of 3, second place 2 and so on, here is the result:

Quality	41%
Price	27
Delivery	24
Service	7
Engineering help	1

First Things First — "Many foundrymen will probably doubt that purchasing agents put quality before price," says Richard C. Meloy, marketing director of the society. "But purchasing agents have certain quality standards below which they cannot fall! Once they have determined that two or more foundry sources meet their quality standards, then price and delivery are determining factors."

Buyers are looking for special qualities in their castings, the survey discloses. Of special importance are machinability, special dimensional accuracy, specified minimum strength and appearance.

That foundries are not doing all they can to produce this desired quality is evident from the many comments written in on the questionnaires. A typical one from a Missouri purchaser: "Our experience with nearly all foundries is that quality will fall off progressively until there is some 'hell raising,' then quality will take a sharp upward jump and start to fall off again. Impress your people that the customer's drawing means what it says."

Too Much Scrap—More than 50 per cent of the respondents stated that a 2 per cent scrap loss is acceptable, but only 41 per cent report experience within that range.

One of the most surprising revelations came when 41 per cent of

the respondents said they prefer regular calls from salesmen. Of the 44 per cent who prefer to call the foundry, there are indications that even this group does not actively discourage regular calls.

Room To Improve—That foundries are weak in this department is evident from the fact that even though buyers deal with an average of 4.6 foundries, less than half the founders call their customers regularly.

While buyers indicated a preference for direct foundry sales vs. manufacturer's agents (97 per cent to 3 per cent), only 85 per cent of the respondents purchase all their gray iron castings direct from the foundry. Their comments indicate that service is the determining factor here. Service and quality are also the main reasons given by 15 per cent of the buyers for purchasing castings at foundries over 200 miles away. Almost half buy within a 50-mile radius.

Further Study—Spurred on by the knowledge that their sales are lagging behind the rate of growth of the economy—and basic metals in particular—gray iron founders are studying this report in greater detail to find ways in which they can improve their service and quality and ultimately increase sales. The survey showed that many customers are completely satisfied with the service and quality of their casting suppliers, but the comments on page 83 are typical of the areas in which some buyers think there can be improvement. Mr. Meloy states that a comprehensive report of the survey is being sent to all members of the society and a follow-up will be made to take advantage of the findings.

Tool Prosperity To Stay

HOW LONG will machine tool prosperity last?

Louis Polk, outgoing president of the National Machine Tool Builders' Association, speculates that it's here to stay. He figures that "for the foreseeable future, approximately $1 billion a year (both in shipments and new orders) can be a continuing probability for machine tool makers."

Three Props—At last week's annual meeting, Mr. Polk (also president, Sheffield Corp., Dayton, O.) pegged this continuing prosperity to three catalysts: Needs for tighter tolerances, unrelenting boosts in living standards and the phenomenal rise in population.

Citing the use of millionths of an inch as accomplished fact, Mr. Polk said the industry has anticipated new requirements of precision and quality control. "That," he warned, "is our industry's continuing responsibilty, and we have the job of living up to it . . ."

Population—He also pointed out that the rising living standard of the average American has been, and will be, met through increased productivity. The trend has fashioned a growing move to mechanization and the refinement of mechanization.

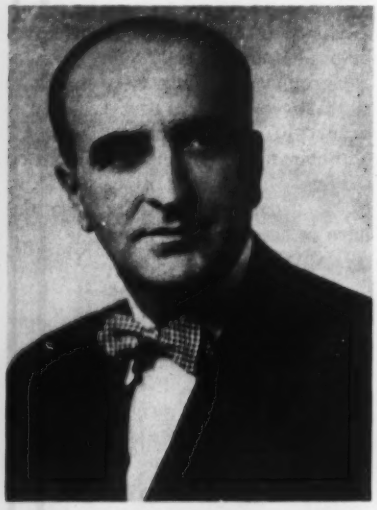
Machine tool prosperity is apparently outstripping that of the economy as a whole. Mr. Polk estimated that the gross national product jumped by nearly 50 per cent from 1950 to 1956.

Outpacing GNP—"But the machine tool industry in the same period has turned in an even better performance. Our industry's shipments have climbed almost three times, from about $305 million in 1950 to approximately $860 million in 1956."

New Officers—J. A. Raterman, president, Monarch Machine Tool Co., Sidney, O., is the new association president. Alfred V. Bodine, president and treasurer, Bodine Corp., Bridgeport, Conn., takes over as first vice president.

Tell Berna, the association's executive vice president and its pilot for 20 years, will retire on Feb. 1, 1957. His place will be taken by Ludlow King.

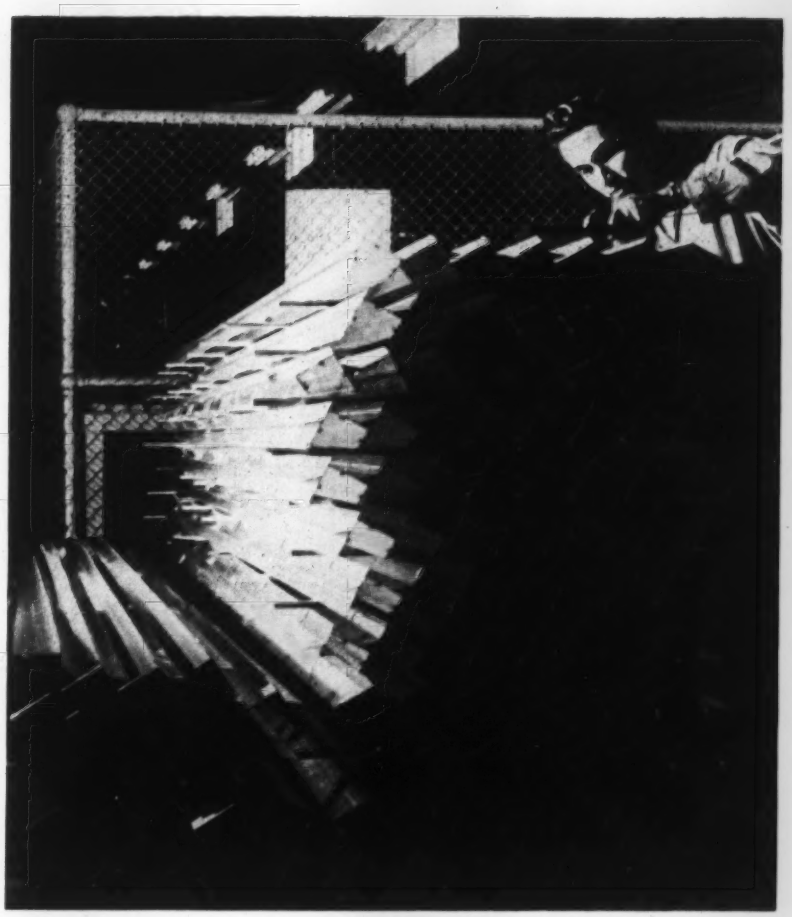
J. A. RATERMAN



LUDLOW KING

TELL BERNA

. . . Figure in executive shifts of National Machine Tool Builders' Association



Aluminum is in on the migration: Commonwealth Extrusion Corp. (owned by Texas Aluminum Corp.) began operating its extrusion mill in May, 1955. The firm's production goal is 1 million lb of extrusions per month

New Ideas on Puerto Rico

COMPETITION for U.S. markets among Puerto Rican based American firms is becoming increasingly important. The dollar volume of metal products shipped to the U.S. jumped from $1 million in 1950 to $13 million in 1955.

Thirty metalworking companies with tax free branches on the island are tapping east coast markets especially, reports the Economic Development Administration. Chicago's United Drill & Tool Corp., for example, picked the commonwealth for hand tool manufacturing operations to meet foreign competition in the states.

Profit Picture—EDA notes that such operations are gaining profits averaging 18 per cent of net sales, because of favorable labor rates and plant leasing arrangements.

But there's more to the Puerto Rican story: U.S. metal fabricators believe the island itself is a good market for their products, as well as a logical stepping stone to Latin America. Watch for more U.S. industry to locate on the island to tap its annual need for $150-million worth of metal products and machinery, which it now buys from the U.S.

And at least one company has already established a branch plant to meet European competition for Latin American markets.

Consumption—Three other examples of the island's potential annual consumption of metal products: 1. The $4 million now spent on metal furniture will jump to at least $7 million by 1963, when the Department of Education alone expects to order $4-million worth.

2. American Can Co.'s new $1-million plant will produce 150 million cans a year for the pineapple packing industry.

3. Operation Bootstrap (STEEL, Aug. 13, p. 61) has located about 450 factories in Puerto Rico, and the number will double by 1963, says EDA. Those plants, plus the 2000 others long established on the island, will create a greater need for service industries.

New Construction — A record high of $135 million in new construction this year will probably be beaten in 1957. (A $100-million hotel building program is in the cards.) To take advantage of this potential, Iron & Steel Industrial Co. will soon start producing 14,000 tons of concrete reinforcing steel bars a year.

Other progress reports: Monitor Industries of Rockland, Mass., says sales of its tool and die branch at San Juan are increasing at a rate of 5 to 10 per cent a month. It expects to double capacity. Industrial Development Co. (EDA's plant building agency) is putting up a modern packing plant to handle the growing pace of pineapple production.

And Labor—The island's metal industry employs 2250 persons at an average wage of 90 cents an hour. Productivity, says EDA, ranges from 88 per cent to 100 per cent-plus of U.S. labor's performance. With an estimated 100,000 unemployed, labor turnover is practically nil.

To spur industrialization, EDA helps train workers, offers technical aid and ready built plants for leasing.

Fram Starts Construction

Fram Corp., Greenville, O., has started a $500,000 addition to its plant. It will contain 70,000 sq ft of floor space, says E. E. Eady, plant manager.

'57 Tax Cut Prospects: Much Talk, No Action

EXPECT lots of smoke but little fire over taxes when the new Congress convenes in January. Tax relief for low income groups and small business will be in the limelight, but any action will be limited to closing a few loopholes. Remember, the status quo of the last two years remains in effect. Plenty of opposition (from Democrats as well as Republicans) to income tax reductions is present, especially if the budget surplus is no more than now expected. Fiddling with the corporate rate (a graduated scale?) may be proposed and pushed hard under the pretext that it will benefit small business, but inflation and a continuing high level of government spending will work against any changes in the tax picture.

First Look at the Election Results

The attitude of the administration and Congress toward other matters (as well as taxes) over the last two years is almost certain to be continued by the new administration and new Congress for the next two. Virtually the same political combination will be in power—a group which showed its cautious tone last spring by resisting tax cuts in an election year. Unless the direction of federal spending or income is profoundly disturbed, the government should operate in the economy as before. One possibility for improvement: The Democrats and Republicans may be able to get together this time on social legislation, such as the school program.

Washington Action on Middle East

Washington sources aren't talking about mobilization. Defense planners are stirred up, but they claim to be maintaining a wait-and-see attitude. (President Eisenhower's hands-off policy dictates such a stand.) Work in progress: A recheck of figures on such items as stockpiles, industry capacities and stand-by orders in case action becomes necessary. No action is expected which would rescind orders diverting shipments of short supply materials, like nickel, from stockpile to industry. Nothing is being said about reopening rapid amortization for goals now closed.

Tanker Capacity Is Questioned

A committee of the National Petroleum Council has the job of estimating how much oil tanker capacity is available now and what will be available in 1965. The information will be needed when it comes time for the government to decide whether it should back additional tanker construction on the basis of security needs. The Suez crisis brought out the need for such a study (STEEL, Nov. 5, p. 59).

FTC Reports on Actions

The Federal Trade Commission is stepping up antitrust actions. In the first four months of this fiscal year, 29 complaints have been issued. That compares with an average of only 20 for ten full years, 1944 through 1953. Actions in fiscal 1956 totaled 42. Antimerger actions are also up: Six in the four months' period, compared with seven in the preceding 13 months. Only three such complaints were registered by the FTC from December, 1950, to June, 1955. The increased activity (which will continue) is pointed to as justification for more funds granted FTC by the last Congress.

Interstate Highways

Progress on the interstate highway program is speeding up. Through Oct. 31, states have contracted for 107 projects covering 276 miles of what will be the 40,000-mile system. Estimated cost of the projects let to date is $100 million. Forty more projects worth $120 million are expected to be contracted for by the end of November.

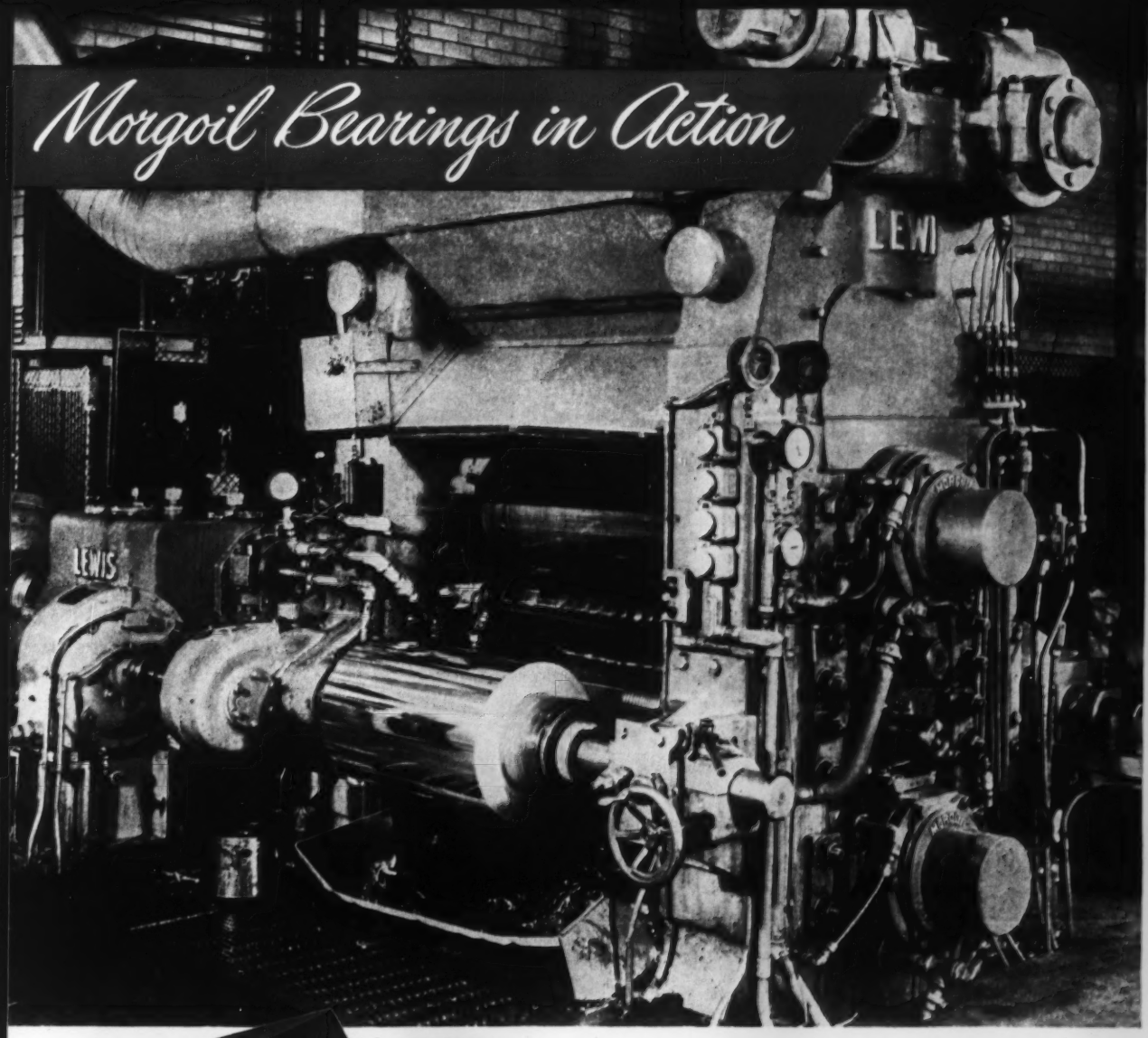
To Buy Texas City Tin

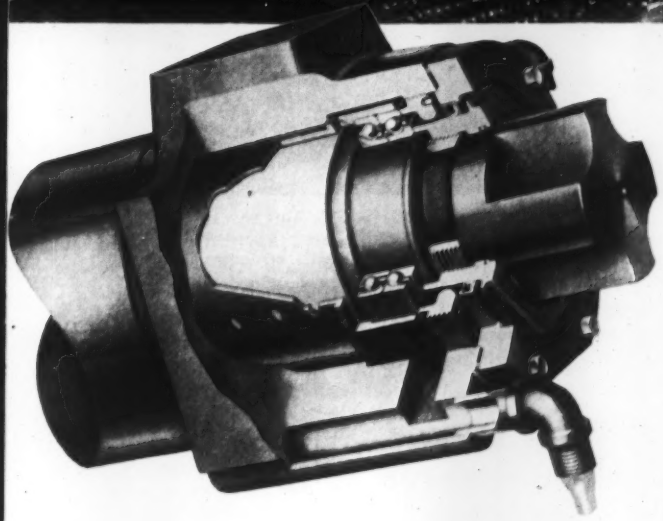
The government is considering two proposals from private industry to buy the Texas City tin smelter. Bidders are Wah Chang Corp., New York, and a group represented by Ellis Patterson and S. Fishfader, Los Angeles. Negotiations will be completed by Dec. 27.

Small Business Picks Up

The Business & Defense Services Administration is still looking for a way to set aside supplies of steel plates for weldment producers in case of defense emergency. Some such plan is needed, says the industry, to avoid delays in weldment deliveries to defense contractors under mobilization conditions. BDSA has one proposal it thinks might do the job, but its development is being held up until more information is available on the size of the weldment industry.

Morgoil Bearings in Action





The 18″-72″ MORGOILS on the 9″ and 21″ x 44″ Aluminum Foil Mill at Cochran Foil Co. pictured above make it easier to produce a quality product at high speed. Foil as thin as .00025 of an inch is rolled at speeds approaching 4000 feet per minute on MORGOIL-equipped mills. MORGOIL BEARINGS give you freedom from wear and fatigue and permit operation at high speeds with remarkable long bearing life.

MORGAN CONSTRUCTION CO.

WORCESTER, MASSACHUSETTS

ROLLING MILLS MORGOIL BEARINGS GAS PRODUCERS
WIRE MILLS EJECTORS REGENERATIVE FURNACE CONTROL

MB-31

MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER

MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER

Now you can get from PROGRESSIVE Slotted Tapping Screws with an extra customized touch — Slotted Tapping Screws which are custom-made to your order. This means: (1) specifically made for you — not bin stock parts; (2) fast, custom-handling of every order; *plus* (3) the double economy of low initial cost *and* the savings in your assembly operations possible only with high precision, torsion-tested fasteners.

STANDARDS AND SPECIALS CUSTOMIZED FOR YOUR NEEDS

THE PROGRESSIVE MFG. CO.
Division of The Torrington Company
76 Norwood Street, Torrington, Connecticut

How Importers Create Markets

1. Introduce metals, products and processes which are not marketed in the U. S., but which fit American needs.
2. Use rifle merchandising techniques: Concentrate first on markets which have been successful overseas.
3. Develop additional markets one at a time, and stay flexible enough to let American ingenuity discover uses.
4. Find applications where the imports are better than U. S. products in terms of engineering and cost.
5. Have the answers at hand to meet technical problems.
6. Sell to the designer first, then go to the purchasing department.

New Look in Importing

The shotgun approach is out of date. Today's creative importer picks products for the American market which have a record of success overseas

IMPORTERS can be of greatest service to metalworking when they sell products that have gained acceptance in foreign markets, says Howard Fromson, president, Fromson Orban Co. Inc., New York.

"But we always keep in mind," Mr. Fromson continues, "that such acceptance does not assure success in this country."

Approach — He describes the technique as creative importing. His company does not use broadside sales methods. Markets in this country are developed one at a time.

A Fromson Orban sales engineer makes his first call on the potential customer's designer, and the possibilities of using a particular import are explored. Purchasing departments are not visited until the designer is convinced.

This brand of service is continued after the sale is made. The company functions as a home office for its American customers, giving the immediate technical assistance needed to iron out operational problems.

Case History—Where does an importer discover a new metal, product or process?

Fromson Orban heard about Lurium (99.99 per cent pure aluminum) from auto makers on the continent. Because of the acute nickel shortage abroad, they are using this nonferrous material for trim. Fromson Orban is now helping U.S. companies develop the know-how needed to handle it.

After Lurium is brightened and anodized, it is second only to lacquered silver in reflectivity. Applications include: Appliance trim, all types of reflectors, cosmetic and lipstick containers and jewelry.

Sales so far range from 10 to 15 tons a month. Detroit holds the key to large tonnage orders.

Outlook—"Once we can show that what we are trying to sell is better than what is in current use," says Mr. Fromson, "American ingenuity takes over and applications mushroom. Our aim is to keep the American market informed of the new metals, products and techniques being developed abroad."

Opportunity—The creative importer can often help large domestic metalworking companies develop new markets in this country. The importer's flexibility and smallness allow him to run market tests. If they are successful, the company can move in and develop additional applications.

End result: The importer will have to be content with a smaller percentage of his total market in this country, but he will benefit from higher total sales as market horizons are broadened.

Westinghouse Sales Hit Peak

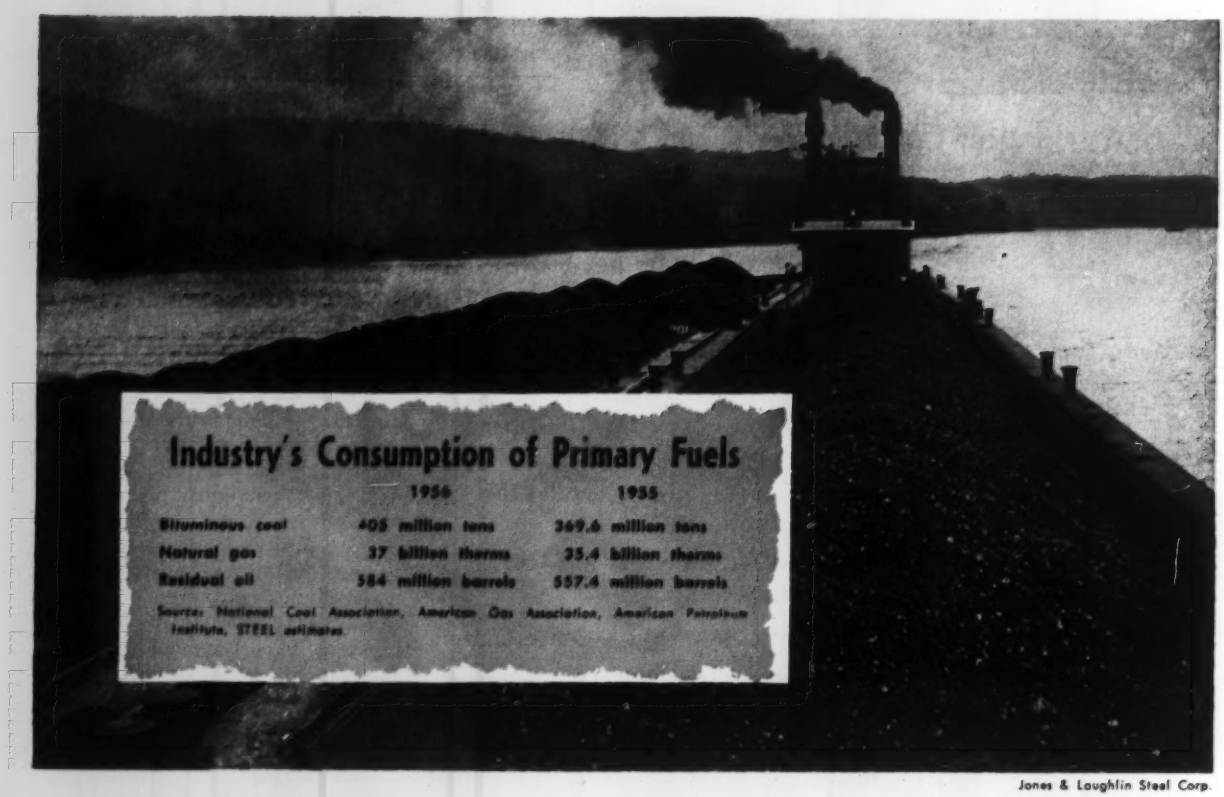
Westinghouse Electric Corp. chalked up three records in the third quarter. New orders hit an all-time high. Sales of $409,717,000 set a record for the period. And employment reached a new high of 127,796.

Gwilym A. Price, president and chairman, told directors that the company is regaining and improving its market position—its post-strike objectives.

"Our backlog of orders," he said, "is 57 per cent higher than it was a year ago. Three months ago, it was 38 per cent higher."

L.A. Tightens Smog Control

Smog control in Los Angeles was strict in the first three months of the current fiscal year, Air Pollution Control District officials have reported. In July, August and September, 854 complaints were filed against air pollution offenders, with 740 convictions.



Industry's Consumption of Primary Fuels

	1956	1955
Bituminous coal	405 million tons	369.6 million tons
Natural gas	37 billion therms	35.4 billion therms
Residual oil	584 million barrels	557.4 million barrels

Source: National Coal Association, American Gas Association, American Petroleum Institute, STEEL estimates

Jones & Laughlin Steel Corp.

Shipping Trouble for Fuel?

Three things could make it tough on users: A hard winter, shortage of freight cars and low level of Mississippi. Suez crisis won't affect domestic oil supplies for some time

TRANSPORTATION troubles may cause some fuel shortages this winter. Most steelmakers have healthy supplies, and productive capacity is ample, but users far removed from the source of their fuels say a cold winter, combined with shortages of freight cars, could pinch them.

Chicagoans say it's hard to get oil by barge because the Mississippi river is low.

Coal — There's no slowness in fuel output. The Bituminous Coal Research Inc., Pittsburgh, says steelmakers used 106.4 million tons of coal for coke manufacture in 1955, compared with 85.3 million tons in 1954. Steel used 6.4 million tons last year for all other purposes—a 10 per cent increase over the 1954 figure.

The outlook is for continued gains in coal consumption by steelmakers. BCR estimates that steel will use 140 million tons for coke manufacture by 1965; 190 million tons by 1980. Coal producers are confident that they can fill long term needs.

Traffic Tie-Up—"We don't anticipate any severe shortage of coal at steel mills, but if we don't have more gondola cars soon, users depending on rail shipment could be caught short late this winter," a leading Pittsburgh coal supplier warns. Eastern users report that increases in rail shipments of iron ore to inland mills could limit cars available for shipment of coal.

Mills supplied by coal barges using the Monongahela river have no complaint. Spokesmen for Jones & Laughlin Steel Corp. and U.S. Steel Corp., Pittsburgh, say mills in that area have good supplies.

Oil—War in the Middle East and scattered transportation difficulties are the only clouds in an otherwise bright fuel oil supply picture. A European shortage could develop if Middle East pipelines and the Suez canal were closed. American oil producers say they could fill European needs without hampering industry here, but under these circumstances, supply could tighten in 1957.

Donald G. Clark, vice president, sales, Allied Oil Co., Cleveland, reports that the supply of residual oil is "adequate in Cleveland but could be tight in Chicago this winter. The situation is likely to continue while steel operations are heavy." Tank cars are scarce, slowing rail movement. While the supply of oil in the Chicago area

is adequate now, prices and supply may stiffen in midwinter.

No one fears a lack of capacity to meet future oil needs. As Dr. Robert E. Wilson, chairman, Standard Oil Co. (Indiana), comments: "The oil industry has grown more than seven-fold in volume since 1918. There is no danger of running out of oil in the foreseeable future."

Gas—The American Gas Association, New York, announces that gas sales to industrial users totaled 35.4 billion therms in 1955, compared with 30.4 billion in 1953 (1 therm equals 100,000 Btu). Steel mills generally report good storage facilities. Suppliers are confident of meeting demand, although a severe winter could cause utilities in northern states to rely on stand-by facilities.

LP Demand—Steelmakers continue to use more liquefied petroleum gas. Sales to them totaled 12.3 million gallons in 1955, compared with 7.6 million in 1954, reports the American Iron & Steel Institute.

While no critical shortages of LP gas loom in the near future, a shortage of tank cars could limit 1956 sales. As in all other fuels, prospects are for a sales gain this year. The Liquefied Petroleum Gas Association, Chicago, estimates that all industry will use about 20 per cent more of this product this year than it did in 1955.

Pipe Moves to the Super Inch

To move 80-ft sections of steel pipe on flatcars which are only 53 ft 6 in. long, Southern Pacific is using the flats in units of five: Two loaded cars with empties between and at each end. The overhanging pipe swings free over the unloaded cars. Longer cars couldn't negotiate curves.

The pipe is destined for Pacific Gas & Electric Co.'s Super Inch natural gas pipeline and comes from the Columbia-Geneva Steel Division of U.S. Steel Corp.'s plant at Geneva, Utah.

ODM Issues Tax Write-Offs

Fast tax amortization on 21 facilities worth $11,532,217 was authorized by the Office of Defense Mobilization during the two-week period ended Oct. 17.

The largest project O.K.'d was a $3,295,475 expansion for military aircraft engines at Marquardt Aircraft Co., Ogden, Utah. Pan-Am Southern Corp., received a fast write-off of taxes on $3.2 million worth of oil refining facilities at El Dorado, Ark.

Another large write-off went to Alaska Steamship Co., Whittier, Alaska, for a $2-million terminal for train ships.

A. M. Byers Co.

Here's how to lick a common wintertime problem . . .

Melt Snow When It Lands

DRIFTING snow in your outside storage areas can be one of those winter headaches you grin and bear—even though it may cost you production time.

Nicholson File Co., Providence, R. I., uses outside storage for file blanks that have been annealed but not ground. A corrugated metal shed near its manufacturing building houses them.

Plenty Snow—An aisle between the storage shed and the main building is 160 ft long and from 7 to 13 ft wide. In winter, drifting snow used to melt into glazed ice, completely stopping movement of the company's material handling trucks.

Answer to the problem: A steam line under the paving of the aisle. Nicholson laid wrought iron pipe in an area of 1420 sq ft, and piped a solution (50 gallons of water to 36 gallons of ethylene glycol) through a heat exchanger. The solution is distributed in the steam line at about 120°F.

ONE OF A SERIES . . .

What makes a cylindrical roller bearing good?

WELL-MADE, VERSATILE OUTER RACES

Outer races are vital parts of all roller bearings, except where housings can provide hardened and ground operating surfaces. In housings of aluminum, cast iron or un-heat-treated steel, outer races assure a dependable roller pathway.

While the outer race is not normally the critical member of the bearing, it can still suffer fatigue failure, like all objects subjected to stress repetitions. Therefore HYATT outer races are manufactured with the same scrupulous care that we apply to inner races and all other components of HYATT Bearings. We supply a wide variety of outer races, which makes HYATTS versatile enough to fit practically any design requirements. Some of these application and operating advantages are briefly covered at the right.

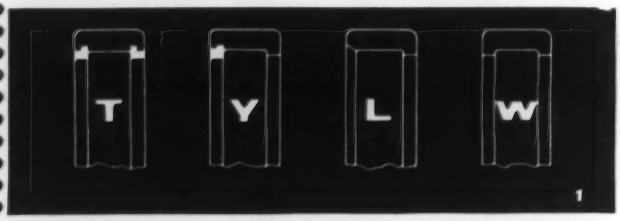
You'll find more details in HYATT General Catalog No. 150, or your nearby HYATT Sales Engineer will gladly help you choose the type best suited to your needs. Remember, HYATT is America's *first* and *foremost* maker of roller bearings. Hyatt Bearings Division of General Motors, Harrison, New Jersey.

GM GENERAL MOTORS

HYATT

HY-ROLL BEARINGS

FOR MODERN INDUSTRY

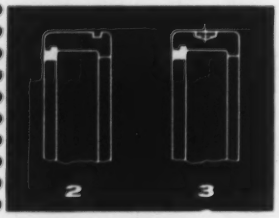


1. OUTER RACE TYPES

HYATT Hy-Load outer races are available in a variety of standard configurations (Figure 1). W, L and Y races have solid flanges, which sustain light or intermittent thrust loads. T and Y races with internal snap rings have equal radial load-carrying capacity but are not recommended for applications under continuous thrust. T, Y, L and W races may all be mounted using roller ends against the solid shoulder or internal snap ring for purposes of locating the outer race axially.

2. CIRCUMFERENTIAL LOCATION

An ample choice of outer race locating methods may be used with HYATT Hy-Loads. Circumferential location is often by a press fit. (Generally the rotating race should be applied with a press fit and the stationary race with a push fit.) When a push fit is used, axial clamping against the race ends provides satisfactory circumferential location. Positive circumferential location is provided by an outer race dowel.



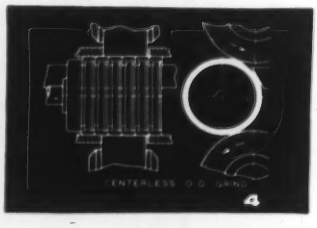
3. AXIAL LOCATION

Axial location of an outer race is usually by pressing or pushing the race to a housing shoulder. The race may be prevented from "walking out" of the housing bore by the flange or snap ring operating against the roller ends. Axial clamping against a housing shoulder or snap ring provides positive axial location. However, if a shoulder is not available in the housing, an auxiliary holding device such as an external snap ring or an outer race dowel is needed. HYATT Hy-Load Bearings can be supplied to original equipment builders with outer races having a snap ring groove (Figure 2) or a blind dowel hole (Figure 3), at moderate increase in cost.

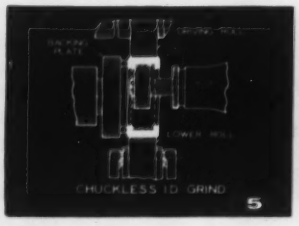
4. OPERATIONAL REQUIREMENTS

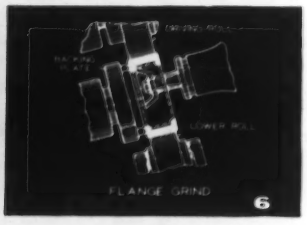
Quality controls are rigidly applied to all HYATT outer races to maintain: a. Minimum wall variation; b. minimum runout of race ends to bore; c. minimum runout of race flange inner faces to bore; d. minimum pathway and outer diameter taper; e. minimum outer diameter tolerance.

5. MANUFACTURING PROCEDURES



After careful primary machining and heat treating, ends are faced off square and parallel by a double end grind. This provides a reference surface from which all runouts and squareness can be gaged. Outer race diameters are generated by the centerless grinding method to provide an O.D. with as little out-of-round as practical. The through-feed method is a valuable economy (Figure 4). Next, the pathway (or race I.D.) is ground centerless, generating a cylinder concentric with the O.D. cylinder, by driving the race on the O.D. and positioning the grinding wheel relative to the drive roll (Figure 5). Finally, flanges are ground using the race ends as a reference. The result is a race of as nearly perfect geometry as is practical (Figure 6). Critical final inspection completes the procedures.





The Conservative View: Auto Sales in 1957*

	UNITS
General Motors Corp.	
Buick	670,000
Oldsmobile	560,000
Pontiac	475,000
Chevrolet	1,500,000
Cadillac	155,000
Ford Motor Co.	
Ford	1,475,000
Mercury	360,000
Lincoln	45,000
Continental	2,000
Chrysler Corp.	
Chrysler and Imperial	150,000
De Soto	120,000
Dodge	160,000
Plymouth	625,000
American Motors Corp.	120,000
Studebaker-Packard Corp.	85,000
Total:	6,502,000

*Estimated by STEEL.

New Car Demand Looks Good

Detroit is having some anxious moments while the bugs are worked out of the new models and dealer stocks are built up to satisfy the expected demand

NEW CAR SALES are showing their usual post introduction surge, but production difficulties have put the brakes on a rapid build-up of dealer stocks.

Ward's Automotive Reports estimates that 150,000 new cars were built in October. Almost all were Fords and Chevrolets. Dealers reportedly have orders for twice that number. Whether they'll be able to get them in time to keep customers from switching to a competitive brand is another question.

Troubles—The usual early production headaches have been harassing assembly lines. It's understood that Ford had to fly several hundred frames into its Rouge, Mich., assembly plant. Frame scrappage for that line supposedly is double original estimates.

A wildcat strike at a Chrysler Corp. stamping plant held up that firm's output for one day. Dodge Division has had trouble getting doors to fit properly.

Vital Issues — Although these headaches are relatively minor, they add up to anxious moments in Detroit. It's vitally important that auto makers fill dealer demands the first few weeks after new models come in.

Ward's predicts 648,900 new cars will be built in November. If this prediction holds (and some car builders are scheduling overtime operations to make sure), it looks like fourth quarter output will come pretty close to the 1.6 million units earlier predicted by STEEL (Sept. 24, p. 79).

Even more interesting than preliminary production problems is the juggling of annual sales and output guesstimates by company executives and sales analysts.

Although most forecasters got singed in 1955, and to a lesser extent this year, they're willing to try again. Output figures quoted at model previews have ranged between 6.7 million and 6.9 million cars for calendar 1957.

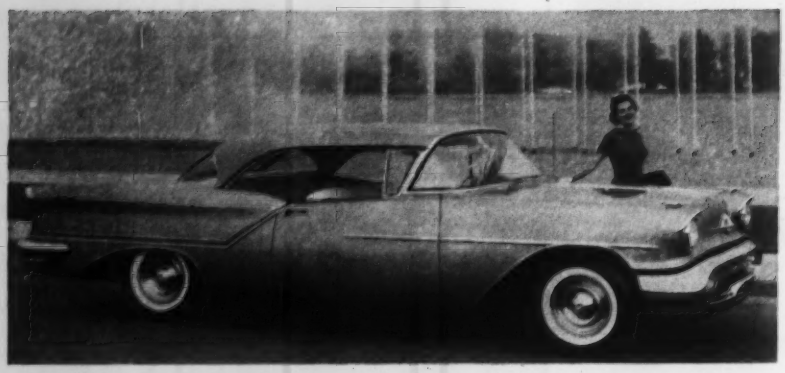
Ease Off—More recently, an air of caution has permeated the industry. At least two auto sales officials tell STEEL (unofficially) that they suspect production of 6.5 million to 6.7 million cars for 1957 is closer to the true mark.

A check among car divisions turns up a conservative sales estimate of 6.5 million cars for calendar 1957 (see table above, left). This figure, incidentally, doesn't include projections for Packards, although the car is scheduled to make its reappearance on the market early next year.

Buyer Appeal—What's going to be the hot car next year? It's still too early to tell for sure, but inquiries among prospective customers for Ford, Chevy and Plymouth bring these responses:

Ford: "I didn't like the Ford when it first came out, but now that I've seen them on the road, they're beginning to look better," says a steel warehouse salesman.

(Material in this department is protected by copyright, and its use in any form without permission is prohibited.)



Oldsmobile's 1957 Golden Rocket 88 Holiday coupe is 2 in. lower and 5 in. longer than last year's model. Its 277-hp engine develops 400 ft-lb of torque

A Detroit area dealer frankly admits that most of his first crop of prospects weren't too eager, but by the second week interest had picked up. He's 26 orders ahead of scheduled deliveries for November.

Chevrolet: The GM competitor admittedly facelifted its body style, but the general feeling is that the treatment is successful. Chevrolet's biggest initial advantage is the Turbo-Glide transmission. Even though it's optional, neither Ford nor Plymouth has anything comparable.

There's a rumor that Ford has stepped up engineering on a similar unit which may be available later in the model year.

Plymouth: The Chrysler contribution seems to be a sleeper. Comments most frequently heard are: "The fins are a steal from Cadillac's Eldorado. What's this galvanized tin piece under the grille?" The "galvanized tin" is aluminum. It won't rust. If Plymouth can get this message across to the buying public, sales should hit the 625,000 mark or better.

Detroit experts still maintain it won't beat out Buick for third place in '57.

Exhaust Notes

• New car sales are likely to slip at the beginning of 1957 because of tight credit restrictions, believes Dr. J. K. Langum, Chicago economist. Dr. Langum also says last quarter sales in '56 will be high because of the initial new model buying spurt.

Driving the Olds

STEEL's Detroit editor makes the first of a series of reports on the new models

WHISKING over Arizona's 116-mile Apache Trail shows the 1957 Oldsmobile (98 Starfire series) has better cornering ability than last year's counterpart. The run also was an excellent opportunity to test transmission braking on 6 to 10 per cent mountain grades.

Most of the credit for an easy ride rests with the rear shock absorbers which this year are mounted outside the springs. The frame is 8 in. wider and total weight is 4511 lb, 300 lb heavier.

No Swing—All this results in a car which still shows a little sway, but practically no rear end swing hitting into the corners.

Acceleration tests on GM's Phoenix, Ariz., proving grounds show the Holiday 98 sedan can go from zero to 60 mph in a fraction under 11 seconds. Moving the Hydra-Matic drive indicator from drive to low position, we managed to knock off a second.

Mileage — On the round trip from Phoenix to Roosevelt Dam, a casual gas consumption check registered around 16.8 mpg at driving speeds ranging from 20 to over 65 mph. About 80 miles were mountain driving at the lower speeds. It seems probable this will be similar to around town consumption after the car is broken in.

The test car we drove was equipped with Olds' four-barreled quadri-jet carburetor. The division is half finished tooling for its multiple barreled job which J. F. Wolfram, Olds' general manager, says should be available on an optional basis by January.

Triple Threat—This unit is a group of three medium-sized twin carbs. It will be combined with a 10 to 1 compression ratio and will boost horsepower to 300. One carb will operate under normal driving conditions. The other two kick in when the throttle hits the three-quarter mark.

Mr. Wolfram beams: "We believe this multiple carburetor is another step in Oldsmobile's program of economy when you want it and power when you need it." The setup is designed to operate with 100 octane fuels.

For the Record—There was no opportunity to test top speed. The speedometer reads up to 120, but getting the needle to that mark may be a different matter.

Other interesting features: Main engine bearings of aluminum, a printed electric circuit for the instrument cluster and a stronger forged crankshaft. List prices range from $2439 to $3603. As seen above, the '57 Oldsmobile has been restyled enough to intrigue buyers, but not so much that '56 owners will be unhappy.

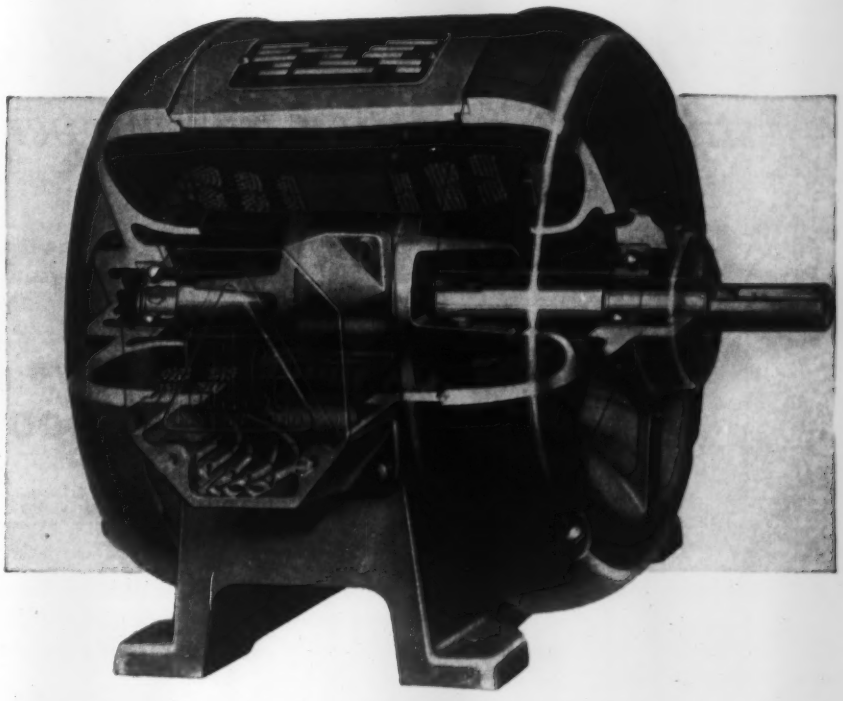
U.S. Auto Output

Passenger Only

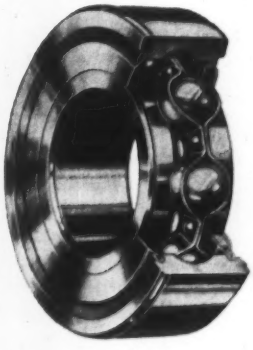
	1956	1955
January	612,079	659,508
February	555,596	675,495
March	575,234	794,015
April	547,766	753,851
May	471,533	724,892
June	430,279	649,393
July	448,804	659,763
August	401,996	614,493
September	190,709†	461,591
October	388,922†	517,813
10 Mo. Total	4,622,918†	6,510,814
November		749,061
December		682,257
Total		7,942,132

Week Ended	1956	1955
Oct. 6	59,351	80,271
Oct. 13	70,175	101,581
Oct. 20	88,557	137,425
Oct. 27	104,269	158,430
Nov. 3	119,525†	167,278
Nov. 10	127,000*	180,754

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.



BALL BEARINGS CUT LUBRICATION MAINTENANCE TO VIRTUALLY ZERO



Precision-made New Departure ball bearings assure permanently accurate support of the rotor shaft under all load conditions and mounting positions, plus cool-running, quiet bearings at all speeds.

In normal operation, New Departure sealed and shielded bearings reduce lubricating requirements to virtually zero. Built-in seals on the inside faces prevent grease leakage *into* the motor. Metal shields at the outer faces keep foreign matter *out* of the bearings while permitting entry of just the right amount of grease from the end bell for perfect bearing operation. Overheating from excessive lubrication can't occur.

Join the leaders who look to New Departure for bearings and engineering service in product development and improvement. New Departure, Division of General Motors, Bristol, Connecticut.

BALL BEARINGS MAKE GOOD PRODUCTS BETTER

SEE "WIDE WIDE WORLD"
SUNDAYS—NBC-TV

NEW DEPARTURE
BALL BEARINGS
GM GENERAL MOTORS

NOTHING ROLLS LIKE A BALL

How to save on critical alloys and still get high alloy turbine performance

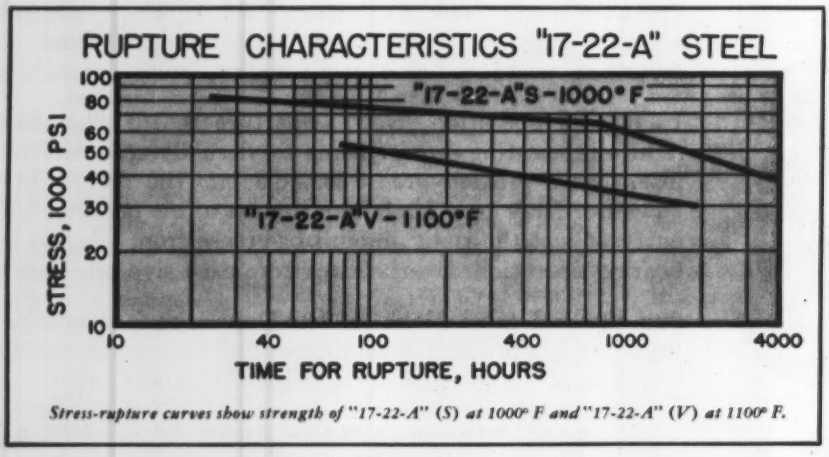
USE "17-22-A" STEELS

Contain less than 3% alloy... give maximum strength to 1000° and 1100°F

YOU don't have to use an expensive high alloy steel for gas turbine or other parts that operate up to 1000° and 1100° F. You can use "17-22-A" steels made by the Timken Company—*low* alloy steels—to do the same jobs. They give *high* alloy performance, save critical alloys, cut costs. They contain less than 3% alloy, yet they give maximum strength up to 1000° and 1100° F.

You get more advantages. "17-22-A" steels resist heat checking and thermal cracking. They are readily workable up to 2300° F. They are easily machined and welded. And maximum high temperature properties can be developed by normalizing and tempering, minimizing the possibility of distortion and quench cracking.

Send for complete information on "17-22-A" (S) steel, and its companion analysis, "17-22-A" (V), recommended for temperatures up to 1100° F. Ask for Technical Bulletin 36A. And call upon our technical staff for help with your high temperature steel problems. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable: "TIMROSCO".

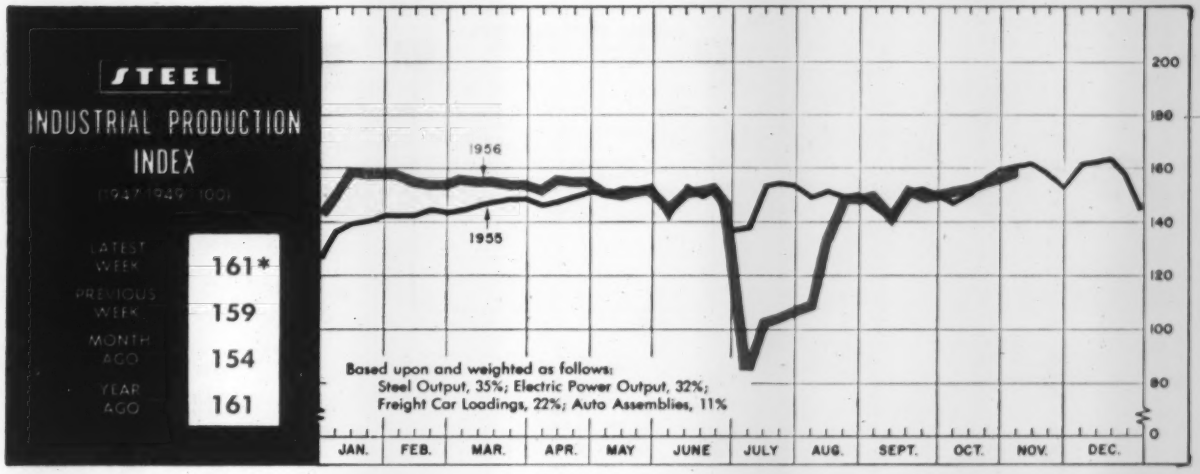


Stress-rupture curves show strength of "17-22-A" (S) at 1000° F and "17-22-A" (V) at 1100° F.

TIMKEN *Fine Alloy* STEEL

TRADE-MARK REG. U. S. PAT. OFF.

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING



*Week ended Nov. 3.

Production Records: Autos Hold the Key

JUST HOW HIGH over-all industrial production is going to climb in the fourth quarter depends on how fast auto producers can lick their many problems and shift into high gear. While production of new cars has increased every week since Sept. 22, the trend has been anything but spectacular.

Motordom holds the key to the outlook for one simple reason: So much of the nation's industrial capacity is being utilized that even an all-out effort would result in only a small increase in production. For instance, the steel industry has been operating at better than 100 per cent of capacity for nine consecutive weeks. This has set a practical ceiling on many metalworking companies which are operating as fast as the supply of raw materials will allow. Railroad car builders, structural steel fabricators and machinery makers, for example, are limited by steel supplies.

Importance—Among the major metalworking industries, automotive is the biggest one with enough open capacity to make much difference in the total picture. The demonstrated capacity of the industry is more than 200,000 cars and trucks a week. That figure was exceeded many times during 1955, the industry's best year. How much higher it is now will not be known until a new peak is reached. For the week ended Nov. 3—about two months after the first 1957 models rolled off the assembly lines—production was only 138,295 units, according to *Ward's Automotive Reports*. That's only about 65 per cent of last year's capacity.

A comparison with year-ago industrial production figures is inevitable (and somewhat unfortunate) at this time. A "good" year, many businessmen and economists theorize, calls for more than a mere tie with the record. A new mark is required. Fourth quarter, 1955, was in many respects the best three months in our history, showing up as the crest of last year's production wave (see

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,476[1]	2,493	2,404
Electric Power Distributed (million kw-hr)	11,450[1]	11,391	10,853
Bituminous Coal Output (1000 tons)	10,435[1]	10,480	9,991
Petroleum Production (daily avg—1000 bbl)	7,000[1]	6,998	6,777
Construction Volume (*ENR*—millions)	$350.1	$550.5	$394.0
Auto, Truck Output, U. S., Canada (*Ward's*)	145,207[1]	133,132	199,950
TRADE			
Freight Car Loadings (1000 cars)	815[1]	817	809
Business Failures (Dun & Bradstreet)	267[1]	254	230
Currency in Circulation (millions)[3]	$30,794	$30,864	$30,528
Dept. Store Sales (changes from year ago)[3]	+2%	−3%	+8%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$21,768	$22,220	$22,498
Federal Gross Debt (billions)	$275.6	$275.6	$279.8
Bond Volume, NYSE (millions)	$18.6	$15.9	$17.0
Stocks Sales, NYSE (thousands of shares)	10,599	7,848	9,695
Loans and Investments (billions)[4]	$85.6	$86.1	$85.6
U. S. Govt. Obligations Held (billions)[4]	$26.1	$26.4	$30.9
PRICES			
STEEL's Finished Steel Price Index[5]	225.58	225.58	208.90
STEEL's Nonferrous Metal Price Index[6]	256.3	254.1	264.4
All Commodities[7]	114.9	115.0	111.1
Commodities Other Than Farm & Foods[7]	123.0	123.0	118.7

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1956, 2,461,893; 1955, 2,413,278. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100

HAND PROTECTION

TOPS for QUALITY, ECONOMY, SAFETY

JOMAC HR GLOVES

- Made of long-wearing brown-and-white mock twist yarn
- Insure safe handling of rough, heavy objects
- Dependable insulation against heat
- Can be reconditioned again and again
- Interchangeable—four long-wearing surfaces with each pair
- Outwear other types of gloves by 3 to 1!

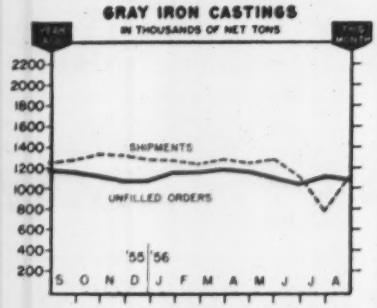
SEND FOR FREE CATALOG

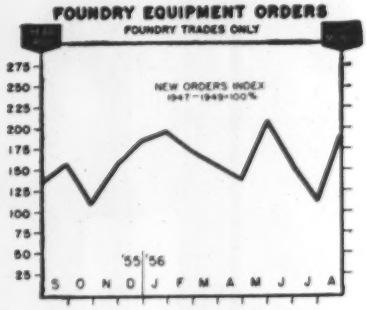
Jomac manufactures all types of hand and wrist-to-shoulder protection — all made from famous loop-pile Jomac Cloth. Get your copy of the new Jomac Industrial Work Gloves Catalog. Write on your business letterhead to: Jomac Inc., Dept. E, Phila. 38, Pa.

JOMAC
INDUSTRIAL WORK GLOVES

Plants in Philadelphia, Pa., and Warsaw, Ind.
In Canada: Safety Supply Co., Toronto

THE BUSINESS TREND





	Shipments 1956	Shipments 1955	Unfilled Orders* 1956	Unfilled Orders* 1955
Jan.	1,250	1,092	1,158	782
Feb.	1,215	1,106	1,141	852
Mar.	1,255	1,315	1,163	842
Apr.	1,218	1,294	1,145	966
May	1,236	1,310	1,086	938
June	1,152	1,296	1,041	982
July	763	1,070	1,109	1,050
Aug.	1,103	1,226	1,074	1,160
Sept.	....	1,253	....	1,151
Oct.	....	1,310	....	1,113
Nov.	....	1,306	....	1,062
Dec.	....	1,260	....	1,075
Total	....	14,838		

*For sale. U.S. Bureau of the Census

	1956	1955	1954
Jan.	195.6	81.0	173.8
Feb.	169.0	90.4	99.9
Mar.	152.7	163.6	82.7
Apr.	135.2	178.6	125.3
May	207.0	145.7	80.8
June	156.7	186.8	86.4
July	110.3	213.4	68.8
Aug.	188.3	134.0	75.6
Sept.	....	156.7	68.3
Oct.	....	108.6	147.8
Nov.	....	154.4	61.4
Dec.	....	183.9	113.9

Foundry Equipment Mfrs. Assn.

Charts copyright, 1956, STEEL.

STEEL's industrial production index chart, page 97). The battle to stay above that level has been touch and go since the end of the steel strike.

Even Up — Preliminary figures for the week ended Nov. 3 indicate that 1956 is deadlocked with the corresponding period of last year, both registering 161 (1947-1949=100). That's why a strong automotive comeback is so important. A rapid build-up to even 180,000 cars and trucks a week would keep production above the high water mark for the rest of the year.

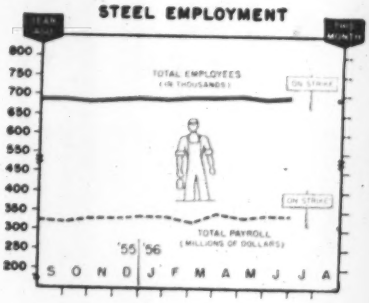
Auto producers feel the demand for new cars is greater this model year than last. But production and supply difficulties have prevented them from capitalizing on it. Strikes at one of Chrysler Corp.'s big suppliers (Electric Auto-Lite Co., Toledo) and General Motors Corp.'s Buick-Oldsmobile-Pontiac branch in Georgia held up deliveries to the dealers' showrooms. Both were settled last week. Retooling and deficiencies of parts have dampened production. If these problems can be ironed out, the auto key will unlock the door to another record production quarter.

Businessmen Confident

Businessmen generally are confident that the economy will continue to expand over the long term. Members of the Purchasing Agents Association of Cleveland Inc.—93 per cent of whom reported a production uptrend in October—project their optimism through the second quarter of 1957. Dun & Bradstreet Inc. polled 1597 business executives and found expectations of high sales, profits and employment for the first quarter of next year, compared with this year's. Prices will be higher, also, say the executives.

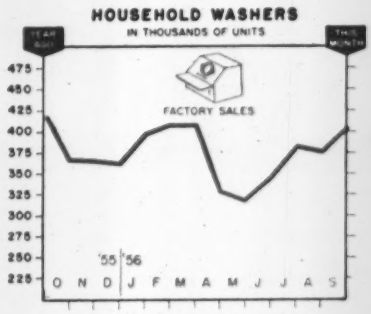
It is the "unusually unanimous" opinion of 221 leading economists surveyed by F. W. Dodge Corp. that "1957 business will be excellent and that no downturn is in sight." But most of the respondents do not expect sharp increases in the major economic indicators. James Dawson, vice president and economist of National City Bank of Cleveland, says: "Business can be expected to hold up during the first half of 1957 and chances are that the second half of next year will be at least as good as the first."

A word of caution is voiced by



	Employment in Thousands		Payroll in Millions	
	1956	1955	1956	1955
Jan.	681	605	$329.1	$258.8
Feb.	684	616	317.3	255.1
Mar.	685	630	338.1	288.2
Apr.	688	643	326.7	282.0
May	680	654	333.6	249.1
June	683	667	332.4	298.4
July	n.a.	676	n.a.	296.8
Aug.	677	680	300.9	320.7
Sept.	688	680	339.0	317.1
Oct.	...	678	....	325.1
Nov.	...	680	....	326.1
Dec.	...	682	....	330.6

n.a.—not available because of strike.
American Iron & Steel Institute.



	Factory Sales—Units		
	1956	1955	1954
Jan.	393,717	357,354	249,956
Feb.	405,631	353,214	295,171
Mar.	405,744	370,555	307,862
Apr.	324,238	313,461	258,712
May	315,249	341,759	246,944
June	340,235	354,470	303,455
July	380,172	245,879	242,863
Aug.	373,925	403,770	293,243
Sept.	402,631	414,919	379,666
Oct.	.....	362,335	339,169
Nov.	.....	361,341	308,368
Dec.	.....	357,503	264,803
Totals	.....	4,236,500	3,490,212

American Home Laundry Mfrs. Assn.

the Value Line Investment Survey. Its business forecaster, based on seven important indicators, has been in a steady decline since the second quarter. Historically, this trend line precedes a general business fluctuation by four to six months.

Wholesale Prices Decline

Look for the wholesale commodity index of the Bureau of Labor Statistics to show a decline for October. The average in September was 115.3 (1947-1949=100), but the index has shown weakness in the weekly tabulations since then. The latest week's reading (ended Oct. 30) was 114.9. It will be the first break in the steady rise of wholesale prices since the beginning of the steel strike. The decrease is accounted for wholly by farm and food price reductions. The "all other" classification has continued its upward climb.

Founders Eye Record

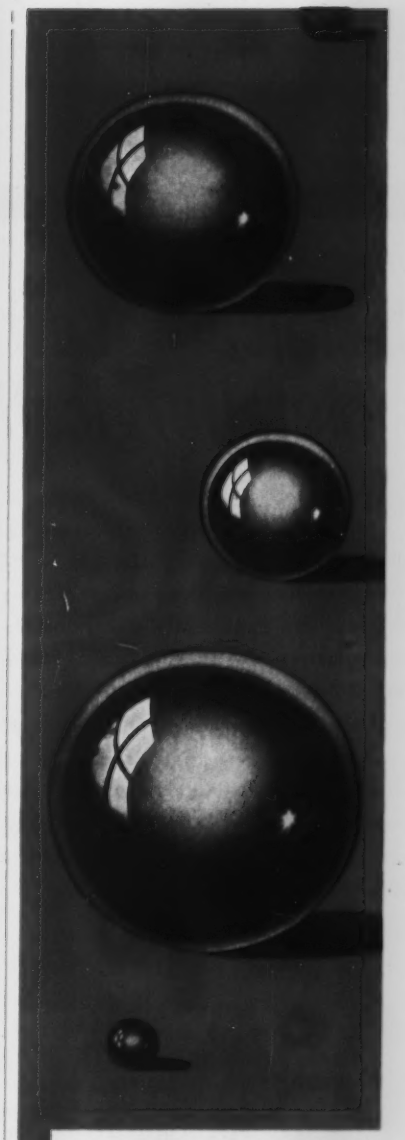
Figures for August indicate that gray iron founders recuperated quickly from the steel strike (see chart on page 98) and took a big step toward setting the annual record of over 15 million tons predicted by the Gray Iron Founders' Society (STEEL, Oct. 1, p. 118). Despite extension of the steel strike into August and the slow pace of the auto industry that month, the founders came within about 10 per cent of reaching the prestrike level.

Perhaps the end of the steel strike injected stability into the business picture and encouraged founders to start buying new equipment. As the table on page 98 shows, they bought a greater dollar volume of equipment in August than in any other 1956 month except May and January.

Trends Fore and Aft

• John T. Brown, chairman and president, J. I. Case Co., says his company's farm machinery sales for the fiscal year started Nov. 1 should exceed the previous year's by 5 to 10 per cent and possibly more if the southwest drouth situation improves.

• Steel industry employment in September equaled the previous record of 687,900 set last April (see table above). Total payroll was the highest for any month on record—$338,990,000.


COOLIDGE
Balls
CHROME ALLOY AND STAINLESS
COOLIDGE CORPORATION
MIDDLETOWN, OHIO

Ohio Rolls

Chemically Correct Metallurgically Sound

Through the entire complex and exacting process of manufacturing OHIO ROLLS, Ohio's metallurgists, chemists, engineers and inspectors are continually analyzing, testing and inspecting. Their job is to make sure that every Ohio Roll meets exact specifications for metal analysis, hardness, tensile strength, dimension and finish. Ohio's quality control techniques and casting skills are your best assurance that Ohio Rolls deliver higher tonnage . . . give longer, more profitable service under critical operating conditions.

When you need rolls—large or small—call in your Ohio Roll Representative. He understands production requirements, and he can help you solve your roll problems quickly and efficiently.

OHIO ROLLS SERVE THE WORLD

shaping metal for all industry

Carbon Steel Rolls ● Ohioloy Rolls ● Ohioloy "K" Rolls ● Ohio Double-Pour Rolls
Chilled Iron Rolls Dense Iron Rolls ● Nickel Grain Rolls ● Special Iron Rolls
Nioloy Rolls ● Flintuff Rolls ● Forged Steel Rolls

THE OHIO STEEL FOUNDRY COMPANY

LIMA, OHIO Plants at Lima and Springfield, Ohio

A. DALE MITCHELL
. . . president, Waterbury Farrel

Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., elected **A. Dale Mitchell** president to succeed the late **Joseph Schaeffer.** Mr. Mitchell was treasurer. **Fred S. Van Valkenburg,** former vice president and head of the wire mill machinery division, was elected chairman to succeed **R. L. Wilcox** who retired several months ago.

Vanadium Corp. of America appointed: **Harry E. Orr** vice president-engineering sales, Pittsburgh; **Raymond H. Filsinger,** assistant vice president-sales, New York.

Thomas A. Kelly, executive vice president, was elected president and chief operating officer of **La-Salle Steel Co.**, Hammond, Ind. He succeeds **T. Lloyd Kelly,** now chairman.

Robert Logie was elected executive vice president, **Firth Sterling Inc.**, Pittsburgh. He was president of National Roll & Foundry Co.

Howard J. Seel was made chief engineer, Cleveland division, **Harris-Seybold Co.**

Peter P. Wojtul, effective Jan. 1, assumes the post of vice president, fiber drum division, **Continental Can Co.**, at Van Wert, O. He will replace **Carl E. Eggerss** who retires Dec. 31. Mr. Wojtul currently is vice president in charge of sales in New York.

JOHN A. CARRINGTON
. . . Harvill Corp. gen. sales mgr.

John A. Carrington was appointed general sales manager, **Harvill Corp.**, Los Angeles.

James MacCracken Adair was made sales manager, Dynamatic Division, **Eaton Mfg. Co.**, in Kenosha, Wis. He succeeds **G. E. Walk,** resigned. Mr. Adair was sales manager, Electric Motor Division, Hoover Co.

Sperry Rand Corp. appointed **A. L. Coulson** vice president-sales for its **Ford Instrument Co. Division,** Long Island City, N. Y. He was sales manager.

Herbert A. Beyer Jr. was made sales manager, machine tool division, **DeVlieg Machine Co.**, Ferndale, Mich.

H. J. Halliday, formerly purchasing agent, was named director of purchases for **Jeffrey Mfg. Co.**, Columbus, O. Divisional purchasing agents appointed: **C. A. Lane,** industrial division; **C. E. Firestone,** mining division; **E. L. Corwin,** machinery and factory supply.

Tennessee Coal & Iron Division, U. S. Steel Corp., Birmingham, named **John G. Munson Jr.** division superintendent, Fairfield Steel Works; **J. A. Winston,** staff assistant to the vice president-operation; **Augustus Cook,** general superintendent, Bessemer rolling mill.

W. H. BENNETT
. . . Hydraulic Press Mfg. president

W. H. Bennett was elected president, **Hydraulic Press Mfg. Co.**, Mt. Gilead, O., division of Koehring Co. Former vice president-sales, he succeeds **John C. Coonley,** resigned.

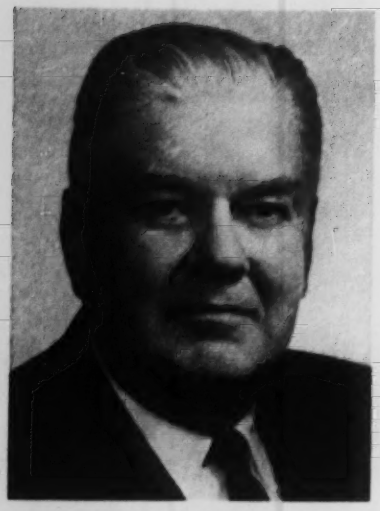
Warren E. McKittrick, general manager, Allied Steel & Conveyors Division, was elected vice president of the parent firm, **Sparton Corp.** (previously Sparks - Withington Co.), Jackson, Mich.

Dayton Steel Foundry Co., Dayton, O., appointed **Dr. William D. Walther** to head its new research and development division; **Harold G. Melia,** to head its new industrial engineering division; and **Eugene M. Mitchell,** assistant sales manager.

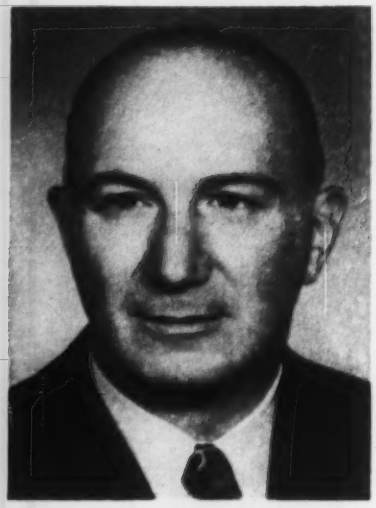
Perfection Industries Division, Hupp Corp., Cleveland, elected **Daniel N. Gredys** vice president-engineering; **H. A. Consor,** vice president-manufacturing, Cleveland plant; **John Gardner,** vice president-manufacturing at Waynesboro, Ga.

R. H. Beadle was made chief engineer, diesel engineering department, **Fairbanks, Morse & Co.**, to replace **E. L. Dahlund,** resigned. Mr. Beadle has headquarters at Beloit, Wis.

Frank T. Goll, assistant sales manager, was promoted to sales man-



WALTER F. MUNFORD



VAN H. LEICHLITER

. . . executive changes at American Steel & Wire

ager of **C. A. Norgren Co.**, Englewood, Colo.

Walter F. Munford, president, American Steel & Wire Division, **U.S. Steel Corp.**, Cleveland, was advanced to an assistant executive vice president of the corporation, with headquarters at Pittsburgh, effective Dec. 1. **Van H. Leichliter,** vice president-operations, **American Steel & Wire Division,** succeeds Mr. Munford as president.

Gerald Forrest was made sales engineer, special products, **Redmond Co. Inc.**, at Los Angeles.

L. S. Preston was made chief engineer, **Electronic Engineering Co. of California,** Los Angeles.

Standard Tube Co., Detroit, elected **Thomas F. Marlow** vice president-engineering; **Buford S. Wiseman,** vice president-manufacturing.

Arthur C. Correll was made district sales manager, Waukegan, Ill., **Cyclone Fence Department,** American Steel & Wire Division, U.S. Steel Corp. He succeeds **F. E. Kyndberg,** recently made general sales manager. **John L. Marshall** was made assistant general sales manager-commercial.

Ray Hohman was made vice president in charge of the new automotive division of **Detroit Harvester Co.**, Detroit. **John Brooks** was made vice president-general manager, implement division, Zanesville, O.; **Allan W. Greene,** vice president, Moto-Mower Division, Richmond, Ind.

Alfred Luconi was named division superintendent of stainless steel at **U.S. Steel Corp.'s** Gary, Ind., sheet and tin mill.

Vernon L. Loofboro was made general manager, **Gardner Machine Co.**, Beloit, Wis. He succeeds **R. E. Price** who transfers to the parent company, Landis Tool Co., Waynesboro, Pa., as vice president and assistant general manager. **John Mourer** was made assistant general manager at Gardner; **William Kissinger,** plant manager; **John McLaughlin,** machine shop superintendent; **Philip Allen,** assistant manager-abrasive department.

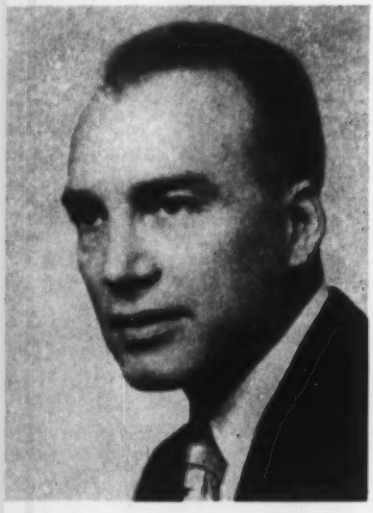
Ren C. McPherson was named manager of **Dana Corp.'s** Auburn, Ind., division to succeed **R. E. Woodcock,** now division manager at Marion, Ind. Mr. McPherson was axle sales manager at headquarters, Toledo, O. Mr. Woodcock succeeds **Mason Hamilton,** resigned.

Rex V. Reynolds was named manager of woodworking industry sales for **Kennametal Inc.**, Latrobe, Pa. He will be assisted by **Don A. Curtis,** formerly with Curtis Machine Corp.

Metal Goods Corp., St. Louis, appointed **Thomas Finley** commodity manager, steel and stainless steel divisions. He will direct sales, procurement and consulting activities.

Dr. John L. McLucas was named vice president and technical director of **Topp Industries Inc.**, Los Angeles. He will head research and development for Topp and its subsidiaries. They include Haller, Raymond & Brown Inc., State College, Pa., and the proposed new subsidiary, Heli-Coil Corp., Danbury, Conn. His headquarters will be at State College.

Donald C. Erdman joined **Sperry Products Inc.**, Danbury, Conn., as assistant to the president. He will aid in developing ultrasonic inspection techniques. Mr. Erdman was



VERNON L. LOOFBORO

R. E. PRICE

. . . Gardner Machine and Landis Tool appointments

CONTROLLED PRESSURE AT 100,000 PSI!

Superior super pressure quality tubing has been used to handle internal pressures from 15,000 to 100,000 psi—offers high fatigue strength, chemical resistance and burst pressure to spare

In *any* industry, handling liquids and gases safely and efficiently under extremely high pressures can be done best by using only top-quality tubing. And Superior *specializes* in premium quality super-pressure tubing.

Superior produces this tubing from specially selected raw materials which have had the inside surfaces conditioned to remove fissures and other defects. In processing, special degreasing operations are performed on the tubing, and the inside diameters are sand blasted to insure a clear, smooth surface.

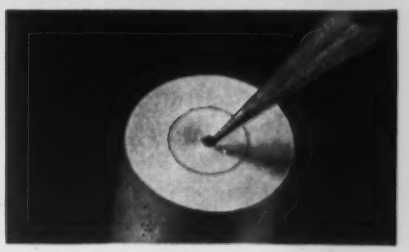
Two types of Superior super pressure tubing are available: a single wall mechanical tubing and a double wall, or composite unit, made from two thinner tubes.

Super pressure tubing is produced in an annealed condition and in ⅛ hard temper, and to mechanical properties specified by the customer.

This tubing is offered in the austenitic stainless steels, Types 304, 316, 321 and 347 and in AISI 4130 alloy steel. It is produced in sizes ⅛" OD x 1/16" ID up to ¾" OD x 1/16" ID. Minimum order quantity for mill production is 50 ft. per size and analysis.

Superior rigidly inspects all super pressure tubing for defects such as fissures by visual and microscopic inspection methods. Each length is hydrostatically tested to 5000 psi—upon request, up to 60,000 psi.

If you have a tubing problem in high pressure processing—or of any other nature—call on Superior. Write Superior Tube Company, 2005 Germantown Ave., Norristown, Pa., for Data Memorandum 22.



The composite type stainless super pressure tubing offers the advantage of having the inner and outer tubes independently worked to mechanical property requirements and of different alloys being combined for strength and corrosion resistance.

SUPER PRESSURE TUBING MINIMUM BURSTING PRESSURES FOR AUSTENITIC STAINLESS STEELS AND 4130 ALLOY STEELS

	MAXIMUM WALL			
OD	.053	.095	.156	.218
⅛	*97,200 84,400			
¼	*40,200 34,800	82,000 71,000		
½	*17,400 15,000	33,500 29,100	62,500 54,000	
⅝	*13,600 11,800	25,000 21,600	47,600 40,300	72,600 63,000

*Top figures all Austenitic Stainless Steels
Bottom figures all 4130 Alloy Steels

Superior Tube

The big name in small tubing

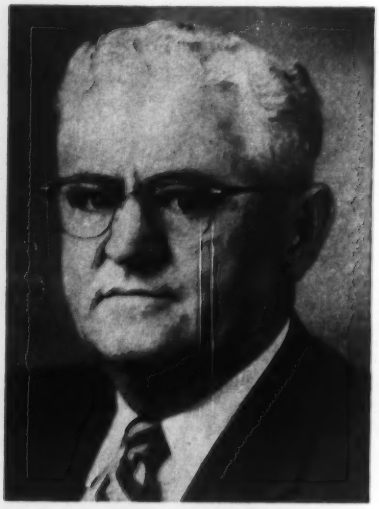
NORRISTOWN, PA.

All analyses .010" to ⅝" OD—certain analyses in light walls up to 2½" OD

West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif. • RAymond 3-1331

JOHN P. LYNN
. . . American Welding mgr.-manufacturing

CHARLES E. ASTON
. . . Williams & Co. sales post



HARVEY W. SEYMOUR
. . . gen. mgr., Page Steel & Wire Div.

president of Electro Circuits Inc. and also served as chief engineer.

John P. Lynn was made manager of manufacturing, **American Welding & Mfg Co.**, Warren, O. Former assistant manufacturing manager, he fills the vacancy created by the election of **Dr. I. A. Oehler** as vice president-operations.

Charles E. Bagwell was named chief engineer, **Hanson-Van Winkle-Munning Co.**, Matawan, N. J.

William J. Meyer was made assistant sales manager, **Automatic Sprinkler Corp. of America**, Youngstown, to succeed **W. E. O'Neill**, recently made sales manager.

Francis H. Wickline was made assistant chief engineer, **National Tube Division**, U.S. Steel Corp., Pittsburgh.

Vincent N. De Cerchio was named assistant to the president of **Orr & Sembower Inc.**, Reading, Pa.

Charles E. Aston was made manager, brass and copper sales department, **Williams & Co. Inc.**, Pittsburgh. He assumes duties of **Milton C. Young** who continues as manager of the aluminum department.

Richard A. Schram was made assistant sales manager, aircraft bearing products, **Shafer Bearing Division**, Chain Belt Co., Milwaukee.

Lawrence A. Zwicker succeeds **J. Ralph Holmes** as chief engineer, **Harrison Radiator Division**, General Motors Corp., Lockport, N. Y. Mr. Holmes fills the new post of technical assistant to the general manager.

William W. Leitch was appointed general manager, vibration division, **MB Mfg. Co.**, division of Textron Inc., New Haven, Conn.

Huck Mfg. Co., Detroit, appointed **Allen R. Tenny** eastern division sales manager; **William Messer**, midwest division sales manager.

Harvey W. Seymour fills the new post of general manager, **Page Steel & Wire Division**, American Chain & Cable Co. Inc., Monessen, Pa. He was plant manager at Monessen Works.

W. G. Brown was made general superintendent, **Seymour Mfg. Co.**, Seymour, Conn. He was acting casting shop director and assistant general manager.

Clive C. Earle was made manager, alloy and stainless steel sales, at the Pittsburgh plant of **Joseph T. Ryerson & Son Inc.**

Rear Adm. Joseph L. Kane, ret., was elected a vice president of **Kennametal Inc.**, Latrobe, Pa.

Harry Giwosky was named vice president - production at **David White Instrument Co.**, Milwaukee.

Robert S. Bell was elected president of **Packard-Bell Electronics Corp.**, Los Angeles, to succeed **Herbert A. Bell**, now chairman.

OBITUARIES . . .

Edward J. Weierstall, 60, vice president-general manager, **Yankee Tools Inc.**, division of Stanley Tools, New Britain, Conn., died Oct. 21.

Rembert A. Marquardt, 52, vice president, secretary, controller of **Bell & Gossett Co.**, Morton Grove, Ill., died Oct. 30.

Harold E. Stavers, 63, Detroit sales manager, **Joseph T. Ryerson & Son Inc.**, died Oct. 21.

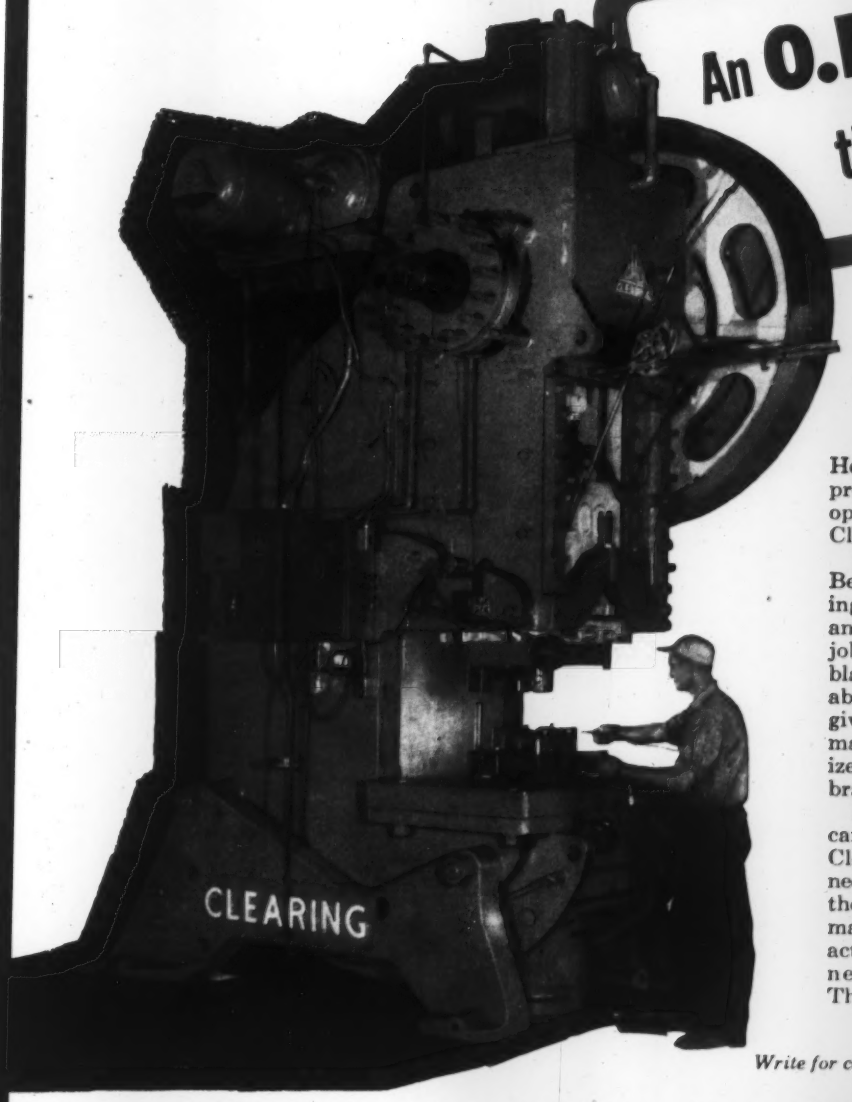
Bently S. Handwork, 70, former chairman, **Joslyn Mfg. & Supply Co.**, Chicago, died Oct. 25.

Ralph J. Tracey, 66, retired chairman, **Overland Metals Inc.**, San Diego, Calif., died Oct. 20.

Charles H. West, 66, vice president-sales manager, **Chandler Chemical Co.**, Cleveland, died Oct. 31.

Edward H. Kaplan, 68, president, **Kaplan Trucking Co.**, Cleveland, died Oct. 15.

An O.B.I. that takes on the BIG JOBS



Ask Warner about their New CLEARING

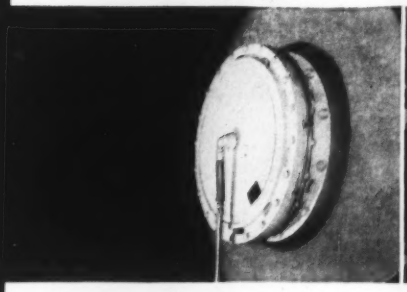
Here's a big press—200 tons capacity—with big press features combined with the convenience of operation and easy feeding found in every Clearing O.B.I.

Warner Electric Brake & Clutch Company, Beloit, Wis., uses this press for drawing and forming parts for their broad line of electric clutches and brakes. They wanted quick changeover from job to job, versatility in feeding, the ability to blank or draw, automatic lubrication and variable speed drive. Their 200-ton Clearing O.B.I. gives them these things and more—hands-off maintenance, air cylinder counterbalance, motorized slide adjustment and air friction clutch and brake.

If you want a high production machine that can take on the big jobs, ask Warner about their Clearing O.B.I. Better still, ask Clearing engineers. They'll help you select the machine that can give your manufacturing operation exactly the kind of support it needs. Call in Clearing. There'll be no obligation.

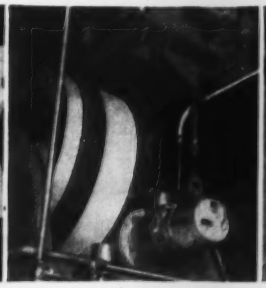
Write for complete catalog on Clearing O.B.I.'s.

This 200 ton press is equipped with Clearing's low-maintenance air friction clutch.



Clearing 31 ton cushion provides blankholding or lift-out pressure as required.

Each press stroke automatically lubricates the machine. Power slide adjustment is also provided.



Variable speed drive provides high speeds for blanking—medium speeds for drawing operations.

CLEARING PRESSES

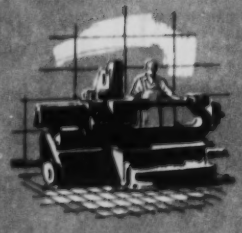
THE WAY TO EFFICIENT MASS PRODUCTION

CLEARING MACHINE CORPORATION • *Division of U.S. INDUSTRIES, INC.*

6499 W. 65th Street, Chicago 38, Illinois • Hamilton Plant, Hamilton, Ohio

A complete line of Roller Bearings . . .

For every field of transportation and industry

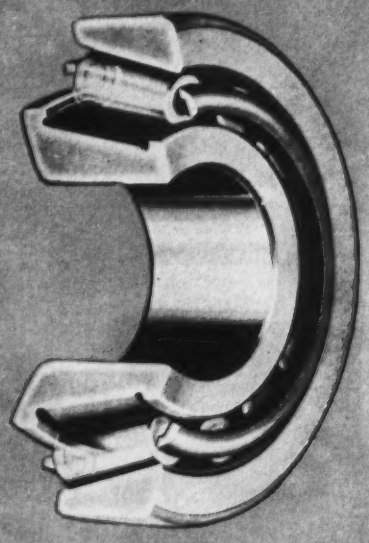


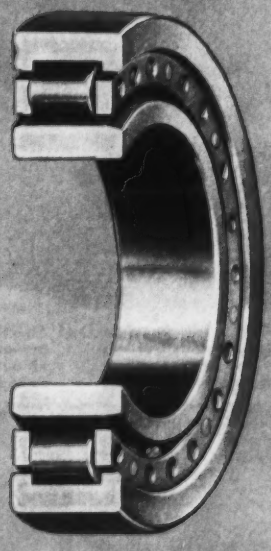
Job-tailored in a wide range of sizes to fit your specific needs

Aircraft? Automobiles? Earth-moving or farm equipment? Whatever you make, if your product uses straight or tapered roller bearings, Bower can meet your specifications exactly. For dependable Bower bearings are virtually custom-built to the job . . . engineered and sized to match any requirement.

Important, too, are exclusive Bower design features that assure long life, top performance, less maintenance. And when you specify Bower bearings you can always be certain of the highest quality materials and workmanship. These reasons, of course, are why Bower straight, tapered and journal roller bearings are used by leading manufacturers everywhere—for any application.

Let a Bower engineer give you full details of the complete Bower line. Call him in while your product is still in the design stage.





BOWER ROLLER BEARINGS

BOWER ROLLER BEARING DIVISION • *FEDERAL-MOGUL-BOWER BEARINGS, INC., DETROIT 14, MICH.*

Kaiser Buys Plant

Aluminum extrusion property in Dolton, Ill., will have annual capacity of 9000 tons

KAISER Aluminum & Chemical Corp., Oakland, Calif., acquired Hokin Aluminum Co.'s extrusion plant at Dolton, Ill. (southeastern Chicago metropolitan area). This plant will enable Kaiser to speed up its planned extrusion expansion program in the Midwest by almost two years. It eliminates the delay involved in building a plant.

Production facilities are housed in a 350,000 sq-ft building. They include five extrusion presses (two 850-ton presses, one 1250 ton and one 2100 ton. A 3000-ton press is being installed). When the fifth press is in, the plant will have an annual capacity of about 9000 tons of extruded aluminum shapes and tubing.

Other equipment includes remelt, billet casting and diemaking facilities and a 100-ton stretcher.

Expansion Aims — Acquisition of the plant is part of Kaiser's over-all expansion program announced in 1955. It includes the construction of several plants and the enlargement of facilities for the production of aluminum mill products. It also covers construction of primary reduction facilities.

Kaiser operates two extrusion plants at Halethorpe, Md. One has an annual capacity of 23,000 tons of extruded products and billets. The other has two 8000-ton heavy presses. They are capable of producing hollow and solid shapes up to 24 in. in maximum cross-sectional dimensions and flat sections up to 32 in. wide and lengths up to 85 ft. Annual capacity of these two presses is 9000 tons.

International Rolling Mill Products Corp., which operates Hokin Aluminum Co. as a division, will concentrate additional effort and funds on the expansion and diversification of its Nikoh Tube Division, which produces electric welded steel tubing and conduit.

Foundry Boosts Production

Flynn & Emrich Co., Baltimore, is increasing its foundry output by about 10 per cent. New core oven equipment is being installed in an addition recently completed. J. F. Turner Sr. is president.

Fab-Weld Takes Over Plant

Fab-Weld Corp., Philadelphia, manufacturer of metal pellets and related products, will occupy the Simpson plant of Hygrade Atlas Co. in the Scranton, Pa., area. The plant in undergoing extensive repairs and will be ready for production about Nov. 15.

To Build Smelter in Canada

St. Joseph Lead Co. is considering proposals to build a multimillion dollar smelter at Bathurst, N. B., Canada. It'll recover copper, lead and zinc.

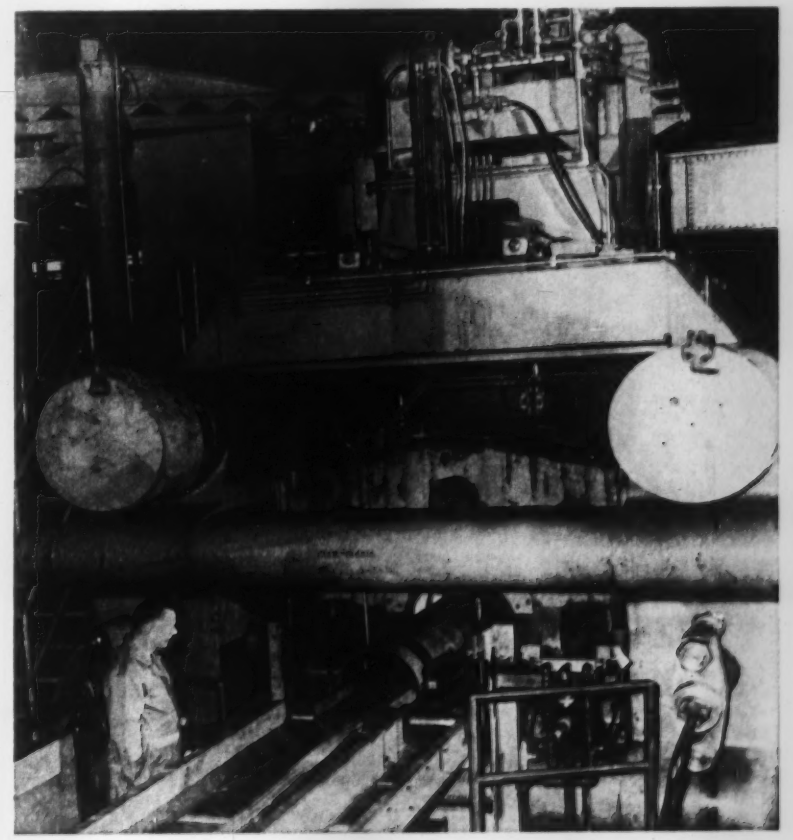
Electromet Opens Branch

Electro Metallurgical Co., a division of Union Carbide & Carbon Corp., New York, opened a sales office at Roseberry and Marshall streets, Phillipsburg, N. J. The office will house the eastern regional (W. H. Ferguson, manager) and New York district (S. L. Jackson, manager) activities.

Firth-Loach Metals Expands

Firth-Loach Metals Inc., McKeesport, Pa., is completing an expansion program which will increase production capacity more than 40 per cent. An extension to the plant adds 2000 sq ft of floor space. New equipment includes ball milling machines, a large capacity hydraulic

(*Please turn to page* 110)



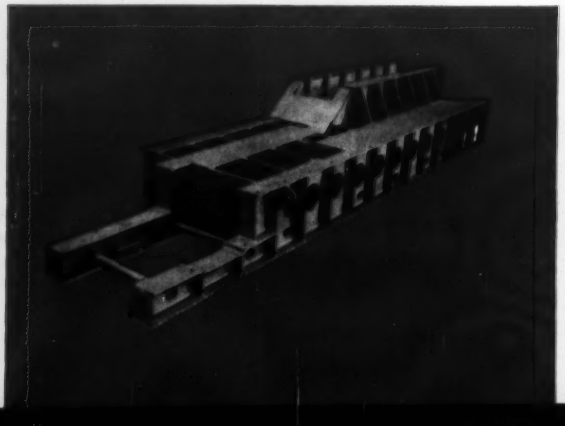
New Source Provides Aircraft and Missile Structurals

This 8000-ton, 288-ft long hydraulic press is in full production at Harvey Aluminum, Torrance, Calif. It turns out large high-strength aluminum alloy shapes for military, defense and commercial needs. The press weighs 2000 tons and is the first to be operated in the West under the Air Force heavy press program. New supporting equipment includes electric ingot casting facilities, homogenizing furnaces, electric induction reheaters, 110-ft vertical heat treat furnaces and two straighteners with 1.5 million and 3 million lb capacities

CONTINENTAL high-speed 21"x53"x60", 4-stand tandem cold mill in the Gibraltar Plant of the McLouth Steel Corporation.

CASTINGS—carbon and alloy steel castings from 20 to 250,000 pounds.

WELDMENTS—fabricated steel plate, or cast-weld design.



BLAW-KNOX
makes what it takes
to cold roll
at high speeds

In the Gibraltar Plant of McLouth Steel, this modern CONTINENTAL 60-inch, 4-stand tandem cold mill rolls steel at delivery speeds in excess of 3,000 fpm.

Designed to meet specific customer requirements, the mill has interesting features, such as—(1) entry and delivery coil conveyors of this cold strip mill, and two single-stand skin-pass mills, are at floor level—which provides greater safety, more efficient handling and easy inspection of all coils during processing. (2) mill equipment has built-in raceways to carry the electrical cables—which simplified the installation and provides easy access for maintenance.

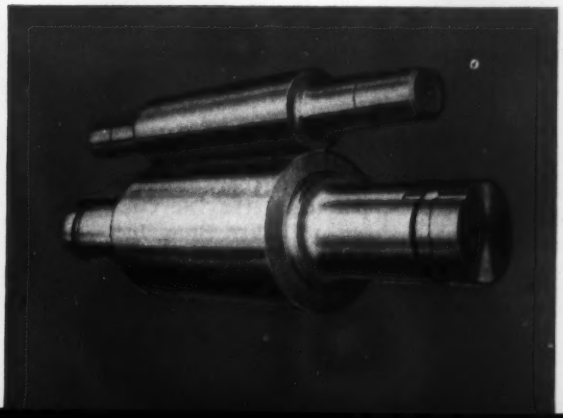
BLAW-KNOX designs and builds *complete* rolling mill installations—assumes undivided responsibility from preliminary engineering to satisfactory operation. At any time we'll be glad to discuss your plans with you.

BLAW-KNOX COMPANY
Foundry and Mill Machinery Division
Blaw-Knox Building • 300 Sixth Avenue
Pittsburgh 22, Pennsylvania

Complete Rolling Mill Installations . . . including all auxiliary equipment . . . for ferrous and non-ferrous metals

Hot strip mills • cold strip mills • slabbing mills • temper mills • universal mills • plate mills • blooming mills • structural mills • rail mills • billet mills • rod mills • merchant mills . . . roll lathes • chippers • special machinery • and complete auxiliary equipment.

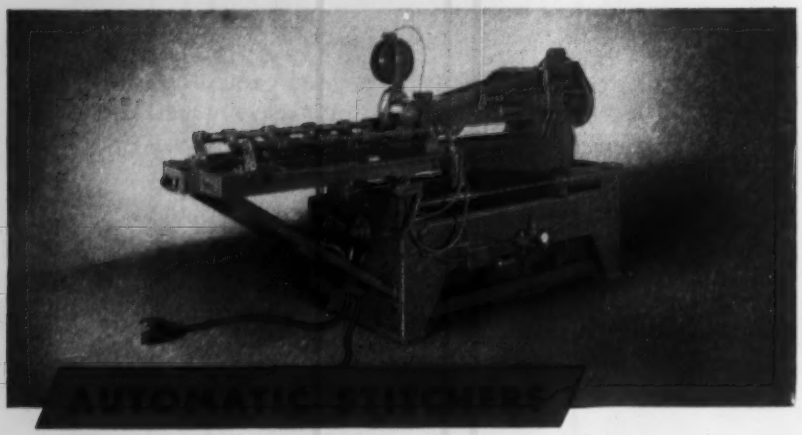
ROLLS—Iron, alloy iron and steel rolls for all types of rolling mills.



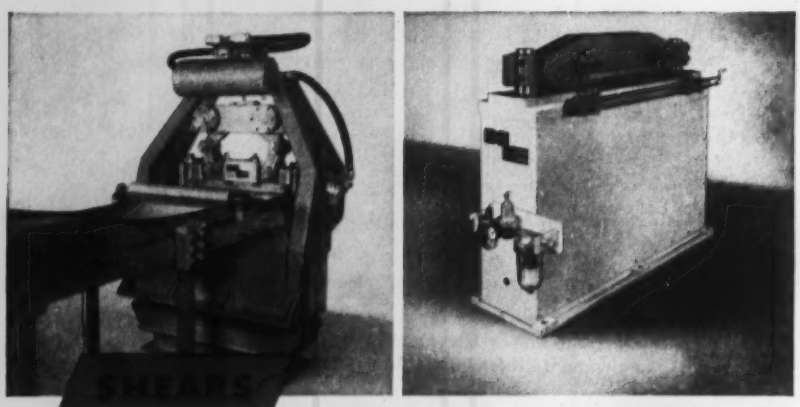
50th Anniversary
BLAW-KNOX
1906-1956

HERR EQUIPMENT

"Complete Processing and Handling Equipment . . . for any Ferrous or Non-Ferrous Material . . . That Starts — or Ends — as a Coil"



Fast, dependable method of fastening the lead end of a new coil to the trailing end of a preceding coil. Entirely automatic. Produces a double row of locked stitches. Practical for strip of any width. Your samples stitched and returned promptly. Also automatic welders.



Fast acting single shears for use with hump tables in cut-to-length and press feed lines, and other applications to square crop the end of a coil. Also twin cut shears that remove the section where two coils were stitched or welded together for continuous processing.

Write for fully descriptive Bulletin No. 561 today!

THE HERR EQUIPMENT CORPORATION

1250 VINE STREET • WARREN, OHIO

CLEVELAND, INDIANAPOLIS AND BERKELEY, CALIFORNIA

(*Concluded from page* 107)

press, furnaces and shaping equipment. The facilities will allow the firm to develop new types of cemented carbides for specialized applications.

Armco Enlarges Facilities

Armco Steel Corp., Middletown, O., is erecting a 16,000 sq-ft research laboratory building at its Rustless Works, Baltimore. It'll cost $300,000. Armco recently completed a $5.5-million bar mill at this plant which makes only stainless. G. D. Moomaw is general manager.

Armco's Sheffield Division, Kansas City, Mo., has purchased Ford Motor Co.'s No. 1 assembly plant in that city. The Ford property adjoins the Sheffield property and includes about 430,500 sq ft in three main buildings.

Standard Tube Expands

Standard Tube & T. I. Ltd., Woodstock, Ont., is constructing a building to provide space for warehousing, assembly facilities, sales offices and showrooms. Products of the company include electric-welded and seamless steel tubes.

Ulbrich Buys Furnace

Ulbrich Stainless Steels Co., Wallingford, Conn., recently acquired an annealing furnace, making it possible for the firm to convert stainless steel strip and flat wire to consumer specifications, hard or soft, in any gage from 0.001 to 0.050 in.

McCormick To Build Plant

McCormick Steel Co. will build a $250,000 plant on Old Denton road, Dallas. The first unit will be used as a warehouse. Frank Flanagan will be manager of the new facility. W. S. Parkinson, vice president, will supervise operations in Dallas and Oklahoma City, Okla.

Lahr Buys Die Casting Unit

Lahr Machine & Tool Corp., Toledo, O., purchased the Die Casting Division of Baker Bros. Inc., that city. John Hoenig is manager of the new division.

For the King and Queen of Extrusion Presses . . . it's FIRTH STERLING HOT WORK DIE STEEL

Giant press extruding an aluminum spar section.

2500 lb. die blanks and a finished extrusion die of Firth Sterling HWD Hot Work Die Steel.

At Kaiser Aluminum & Chemical Corporation's Halethorpe Extrusion Works, operated under a U. S. Air Force lease, are two 8,000 ton capacity extrusion presses—the largest operating units designed and built in the United States. Presently extruding large, complex aluminum shapes—wing spars, wing panel sections, and missile hull sections, for the aircraft industry, the two giant presses, named Rex and Regina, utilize dies made from Firth Sterling Hot Work Die Steel.

Yes, Firth Sterling HWD is a monarch in its own right, with properties capable of withstanding the tremendous pressures of this king and queen of extrusion presses. This intricate process requires materials that can operate continuously in volume production without replacement. These giant presses each weigh 1500 tons and are capable of extruding aluminum shapes more than 85 feet long and over 1200 pounds each in weight. The use of Firth Sterling HWD is tangible evidence of the high opinion modern die makers have of the quality of the material.

HWD Steel is just one of the Firth Sterling line of more than 50 Tool and Die Steels. Ask for a Firth Sterling engineer to cooperate in your next die making problem to assure the correct grade and analysis.

R-326

Firth Sterling

—INC—

GENERAL OFFICES: 3113 FORBES ST., PITTSBURGH 30, PA.

MILLS McKEESPORT, TRAFFORD, DETROIT, HOUSTON, HARTFORD

OFFICES AND WAREHOUSES: BIRMINGHAM CHICAGO CLEVELAND DAYTON DETROIT HARTFORD HOUSTON LOS ANGELES PITTSBURGH WESTFIELD, N.J.

PRODUCTS OF FIRTH STERLING METALLURGY

High Speed Steels
Tool & Die Steels
Stainless Specialties
High Temperature Alloys
Sintered Tungsten Carbides
Firth Heavy Metal
Chromium Carbides
High Temperature Cermets
Zirconium

BEATTY GUILLOTINE BEAM PUNCH GAINS IN POPULARITY

Typical reports pouring in from all over the United States and Canada indicate machine's efficiency and accuracy:

"We have estimated our savings at 75 percent with our new No. 9 Guillotine Beam Punch — thanks to BEATTY."

"Our Guillotine Beam Punch and Structural Spacing Table eliminate hole layout, boost press output 50 percent per man-hour, save 25 percent floor space and spot holes more accurately."

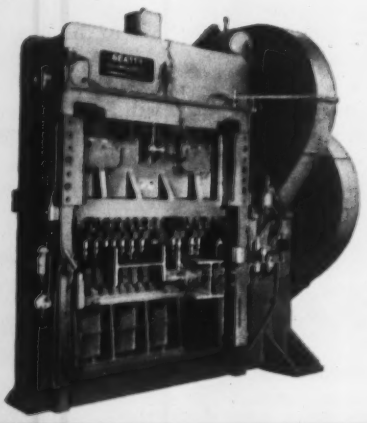
"We appreciate the efficiency achieved with the No. 9 Guillotine Punch. We could hardly get along without this Punch as we do a lot of work with it at a nominal cost."

"Since we are more than satisfied with the performance of your No. 9 Punch and Spacing Table, can you furnish a similar Table for one of our other Punches?"

PRODUCTION GIANT REQUIRES LESS FLOOR SPACE

Ideal machines for punching flanges and webs of beams, Beatty Guillotine Beam Punches require less floor space, offer lower first cost and extreme rigidity. Large die space, clear working space and two-point application of force to the ram affords full capacity loading and punching across the face of the ram.

200-ton Model 9, illustrated, for beams up to 30", punches all holes in web of 30" beam. 150 and 350 ton models also available.



Write For Full Details

BEATTY MACHINE & MFG. CO.
986 150th St., HAMMOND, IND.

NEW ADDRESSES

Hyper Tool Co. moved into its new plant at 12230 Dixie Ave., Detroit 39, Mich.

Kellett Aircraft Corp. moved its plant and offices to new and larger quarters at Easton road, Horsham, Pa. Its post office address is Box 35, Willow Grove, Pa.

Anchor Metal Co., maker of lead and tin products, metals, alloys, solders and fluxes, moved its offices and factory to 966 Meeker Ave., Brooklyn 22, N. Y.

CONSOLIDATIONS

R. L. LeBlond Machine Tool Co., Cincinnati, acquired **Fosdick Machine Tool Co.**, that city. LeBlond makes lathes. Fosdick makes drilling, precision jig boring and grinding equipment. Carl E. Linden becomes president and general manager of Fosdick.

Minneapolis-Honeywell Regulator Co., Minneapolis, purchased **Davies Laboratories Inc.**, Beltsville, Md., maker of specialized high-speed data recording systems. Activities of the Davies Laboratories will be integrated with those of Honeywell's Industrial Division at Philadelphia.

Koehring Co., Milwaukee, will acquire **Buffalo-Springfield Roller Co.**, Springfield, O., effective Dec. 1. The Springfield firm makes asphalt finishing machines, road rollers and soil compaction equipment. Koehring makes concrete finishing and paving equipment, concrete mixers, ditchers, excavating and hauling equipment.

Borg-Warner Corp., Chicago, will purchase **Dittmer Gear & Mfg. Corp.**, Lockport, N. Y., subject to approval of Dittmer stockholders.

Kelsey-Hayes Wheel Co., Detroit, acquired **Koldweld Corp.**, New York. Koldweld holds exclusive rights (from General Electric Co. Ltd. of England) to grant

31 experts collaborated
Greatest book ever written about making iron and steel
440 pages 8½" × 11"
An illustration on every page
of IRON and STEEL

ORDER YOUR COPY OF THIS AMAZING BOOK TODAY!

Everyone in your plant— from top executive to apprentice—will benefit from the use of this book.

It represents years and years of constant "on-the-job" experience in every branch of iron and steel making—every statement in it rings with the authority of actual, first hand experience.

No *one* man could have written this book. It required the combined skills of 31 of the nation's foremost experts . . . men like Charles L. McGranahan on hot and cold-rolled strips and sheets; Waldemar Naujoks on forgings; Alfred E. Kadell on tin plate, and 28 others of equal stature.

Although this book is the work of skilful, highly trained specialists, it is written in simple, non-technical language that the youngest apprentice can understand. To make things even more clear, photographs, charts and other visual aids are employed throughout.

Here's how to order the number of copies you need—

10 DAY FREE TRIAL

THE PENTON PUBLISHING CO.
Book Department
1213 West Third Street, Cleveland 13, Ohio

send me a copy of "the ABC of Iron and Steel"

- ☐ On ten days trial for free examination, following which I will pay for the book at $10, plus postage, or return it in good condition.
- ☐ Remittance enclosed* in which case the book will be sent prepaid.
- ☐ C.O.D.

SIGNED _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

*Add 30 cents to cover state sales tax on orders for delivery in Ohio.

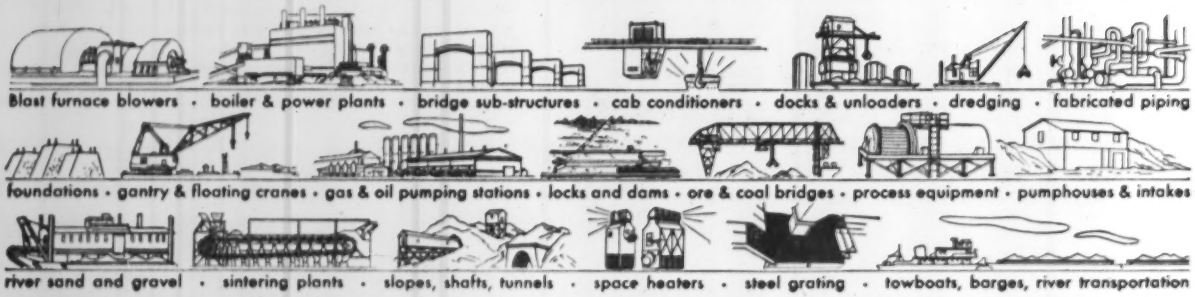
Dravo heaters saved $6,732 per year, also released valuable space for production

Heating costs were high at Ideal Electric and Manufacturing Company's seven-acre plant in Mansfield, Ohio. Thirty-two hand-fired stoves, with fuel bins, used more than 4,000 square feet of floor space and provided anything but uniform heat.

In contrast, only 400 square feet of space was needed when eleven Dravo Counterflo heaters were installed. Result: 3,600 square feet additional floor space for production; $6,732 actual gross savings in one season; constant heat level automatically maintained throughout the plant.

For specific help on space heating or in any of the fields listed below, write to DRAVO CORPORATION, PITTSBURGH 25, PENNSYLVANIA.

DRAVO
CORPORATION


Blast furnace blowers · boiler & power plants · bridge sub-structures · cab conditioners · docks & unloaders · dredging · fabricated piping
foundations · gantry & floating cranes · gas & oil pumping stations · locks and dams · ore & coal bridges · process equipment · pumphouses & intakes
river sand and gravel · sintering plants · slopes, shafts, tunnels · space heaters · steel grating · towboats, barges, river transportation

licenses for the use of the cold pressure welding processes and the manufacture of special tools for them in the U.S. and Canada.

Robert Gair Co. Inc. and **Continental Can Co.**, both of New York, have merged.

ASSOCIATIONS

Gray Iron Founders' Society, Cleveland, presented its highest award, the Gold Medal, to Peter E. Rentschler, president, Hamilton Foundry & Machine Co., Hamilton, O. He was honored for leadership in progressive foundry management. Others who were honored for outstanding service and devotion to the advancement of the industry are: Summerfield Brunk, Headford Bros. & Hitchins Foundry Co., Waterloo, Iowa; R. T. Lewis, Keen Foundry Co. Inc., Griffith, Ind.; J. W. Simmons Jr., Cox Foundry & Machine Co., Atlanta; and E. J. Bothwell, International Nickel Co. Inc., New York.

H. Thomas Hallowell Jr., president, Standard Pressed Steel Co., Jenkintown, Pa., was re-elected president of the **American Standards Association**, New York. Also re-elected were: Van H. Leichliter, vice president-operations, American Steel & Wire Division, United States Steel Corp., vice president; A. S. Johnson, vice president, American Mutual Liability Insurance Co., Boston, chairman of the association's standards council; T. E. Veltfort, manager, Copper & Brass Research Association, New York, vice chairman of the council.

National Tool & Die Manufacturers Association, New York, elected these officers: President, Herbert Harig, Harig Mfg. Corp., Chicago; first vice president, P. R. Marsilius, Producto Machine Co., Bridgeport, Conn.; second vice president, Jack Kleinoder, Volkert Stampings Inc., Queens Village, N. Y.; secretary, H. G. Murdock, Arrowsmith Tool & Die Corp., Los Angeles; treasurer, R. C. Renner, East Dayton Tool & Die Co., Dayton, O.

Here's the perfect answer to your questions on non-ferrous alloys. The well illustrated Riverside products handbook contains a complete listing of the composition and physical properties of the top-quality phosphor bronze, nickel silver and other non-ferrous alloys Riverside makes.

If you use or fabricate metal parts, you'll want to keep this informative book on hand for ready consultation.

Mail coupon today for your free copy!

PHOSPHOR BRONZE AND NICKEL SILVER SHEET, STRIP, WIRE AND ROD

RIVERSIDE HKP

RIVERSIDE METAL DIVISION, H. K. PORTER COMPANY, INC.
Riverside, New Jersey

Please send me my free copy of your new handbook, "Riverside Alloys"

NAME (Please print) .....

COMPANY .....

ADDRESS .....

CITY ..... **ZONE** ..... **STATE** .....

SPECIALLY DESIGNED solve a problem,

Corrugated steel construction of these units provides strength, assures long service life. Special channel construction under boxes permits free movement of casters, yet allows four-way entry for lifting and storing.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

REPUBLIC BOXES speed handling ...save space

Today's modern high-speed machines may meet the demand for increased production. But they can also create problems.

This was the case at the Crown & Closure Division of Crown Cork and Seal Company, Inc., Baltimore, Maryland, world's largest maker of metal closures for glass containers.

Their problem was the handling, moving and storing of the tremendous daily output of a battery of screw cap machines. Some of the machines turn out as many as 100,000 screw cap shells per hour. A handling unit was required that could be used to rapidly move the semi-finished caps from the machines to a final manufacturing operation located on another floor—or to a storage area for future use.

Republic Materials Handling Engineers were invited to work on the problem with Crown Cork Engineers. The solution was the design and fabrication by Republic's Pressed Steel Division of the special box-type trucks shown at left.

Equipped with casters, the boxes can be moved easily by hand. A time-saving feature is a hinged door which opens when the box is tilted forward. This permits the caps to slide out and down a chute to the floor below where final manufacturing is completed. The entire handling operation is simplified and speeded. Storage space is conserved.

This is another example of customer service from Republic—another example of experience and versatility in solving a materials handling problem. Perhaps you would like to talk over your handling problems with a Republic Engineer. There's no obligation. Simply contact the nearest Republic Materials Handling Equipment Representative. Or send us the coupon.

STEEL

and Steel Products

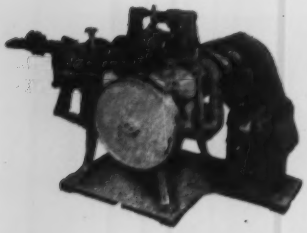
SPEED HANDLING of heavy materials, like bar stock, with Republic Chain Slings, Attachments and Accessories. All Republic Chain Slings are proof tested and warranted to meet or exceed specifications. They provide an exceptionally high degree of safety. Republic's Bolt and Chain Division makes chain slings in Alloy Steel, High Test Steel and Wrought Iron. Republic chain engineers are always available to help you select the proper chain for your particular requirements.

SOLVE THE PROBLEM of storing heavy items with Republic Wedge-Lock Steel Shelving. It is specifically designed for high stacking of enormous weights. As more weight is added joints actually get tighter. Wedge-Lock Steel Shelving provides maximum loading in minimum floor space. It is completely flexible to meet changing space requirements. It can be assembled quickly and easily. Send coupon for full information.

REPUBLIC STEEL CORPORATION
Dept. C-2189
3120 East 45th Street
Cleveland 27, Ohio

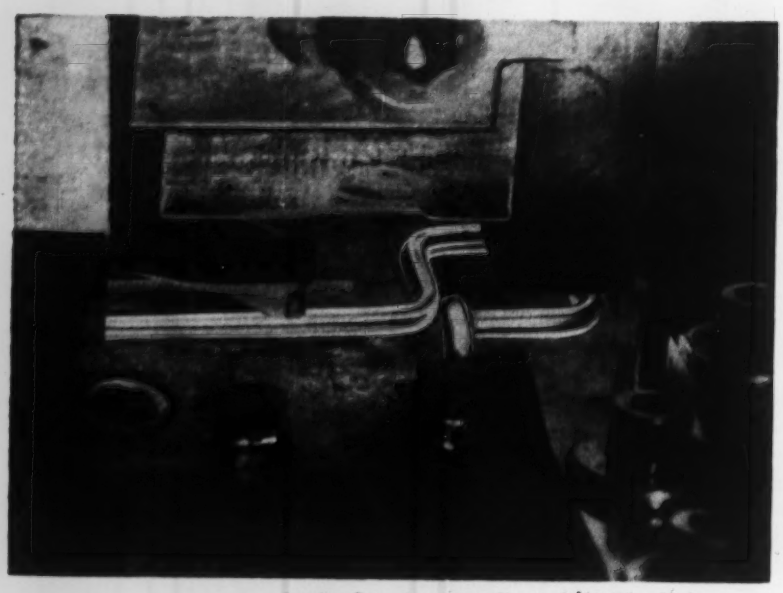
☐ Send more information on Materials Handling Equipment.
☐ Have a Materials Handling Engineer call.
Send additional information on:
☐ Chain Slings ☐ Wedge-Lock Steel Shelving

Name_____ Title_____
Company_____
Address_____
City_____ Zone____ State_____



NILSON 4-SLIDES PAY OFF 4 WAYS

• BIG PROFITS • BIG PRODUCTION
• BIG SAVINGS • BIG GAIN IN ACCURACY



Forming Operation: Meter Shunts of 3/16" Wire Stock

WHY NILSON IS TOPS FOR 4-SLIDES:
Nilson 4-Slides are built for rugged duty
Form both ribbon metal and wire stock
Press capacities 8 to 75 tons, wire diameter to ½"

16 Models Available, Including Combinations of Horizontal Press and 4-Slide

YOU PROFIT BY: Automatic Operation • Increased Production • No Secondary Handling • Improved Products • Fewer Rejects • Lowest Initial Cost

Nilson engineers are always available for consultation on forming problems. Bulletin #61 sent on request.

Nilson's 3 tilt and 3 stationary reels handle wire or ribbon stock coils up to 500 pounds.

A.H. NILSON MACHINE COMPANY

1512 RAILROAD AVENUE, BRIDGEPORT 5, CONN.

Automatic Chain Making Machines • Staple Forming Machines • Wire and Stock Reels • Wire Straightening Equipment • Slide Feeds for Presses • Wire and Ribbon Stock Forming Machines

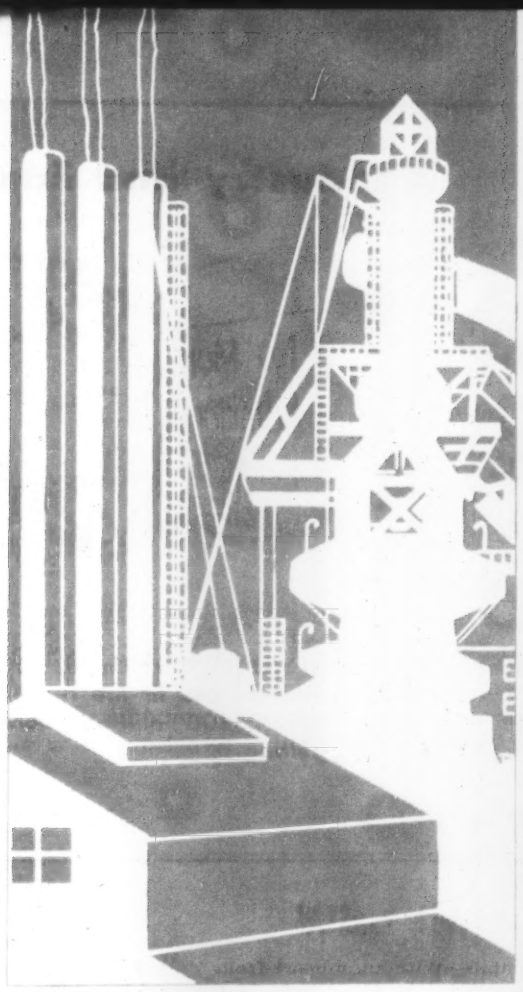
10

STEEL's 1956 Management Series . . .

STEEL's editors herewith present the tenth in their ten-part series, Program for Management for 1956. The complete list:

1. **It's Time To Grow**
   (Feb. 13, p. 81)
2. **Know Your Costs**
   (Mar. 19, p. 83)
3. **Ideas for Industry**
   (Apr. 23, p. 105)
4. **Metalworking Goes to Market**
   (May 14, p. 107)
5. **Metalworking's New Horizons**
   (June 18, p. 137)
6. **How To Live with SUB (Supplemental Unemployment Benefits)**
   (July 16, p. 121)
7. **To Merge or Not To Merge**
   (Aug. 13, p. 89)
8. **Motivating Men To Produce More**
   (Sept. 24, p. 105)
9. **Automation—Bogeyman or Bonanza?**
   (Oct. 15, p. 109)
10. **Industry and College—Partners in Development**
    (Nov. 12, p. 119)

• *Extra copies of these Program for Management articles are available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*



Industry and College: Partners in Development

AID to education, once regarded as charity by industry, has been graduated to a top item on the survival and expansion programs of alert metalworking companies.

The urgency of cultivating and harvesting a yearly crop of management talent in this manner is framed in these words by Irving S. Olds, former chairman, U.S. Steel Corp., New York: Unless industry supports schools to the limit, he warns, "it is not properly protecting the long range interests of its stockholders, employees and customers."

An executive with a firm which will spend $50,000 on education this year told STEEL: "We count this as our most critical investment. Without it, and the returns we get from it, our investment in facilities and research will be worthless. We've got to have good men or we're out of business."

Next Plateau—Some companies add a broader assignment to their "must" role in education. Republic Steel Corp., Cleveland, for example, sponsors a series of summer sessions to educate educators.

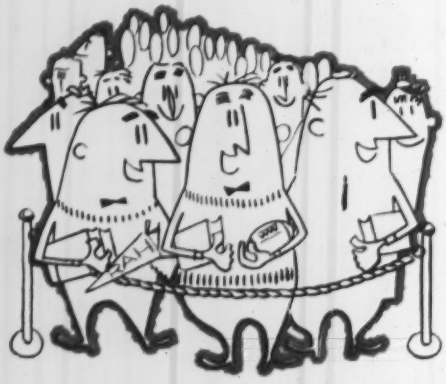
C. M. White, Republic's chairman, observes: "We believe that a better knowledge and understanding of business is of great value to not only this company but to our whole national economy. As the economy prospers, so does Republic."

Big Picture — General Electric Co., Schenectady, N. Y., sums up the objectives of its farsighted educational package this way: First, get new knowledge through research and competent teaching. Second, get an adequate supply of educated manpower. Third, set up an economic, social and political climate in which companies can survive and grow.

Returns—Industry's dollars for education are paying off. Of course, many of the benefits are long range intangibles which don't lend themselves to precise measurement. Short-term dividends are another matter.

Stacy Black, staff director for executive development, Thompson Products Inc., Cleveland, points

Industry and Education . . .



In 1966, a million additional students will crowd the campuses.

At today's enrollment, 50 per cent of the colleges are in the red. Each year they need $500 million more than they're getting.

out that in 1955 and 1956, one of three Case Institute of Technology students with Thompson scholarships came to work with the firm after graduation.

The reputation Thompson has built for itself on the campus also influenced other Case graduates to apply for positions.

Most companies which have gone back to school are faring just as well. They'll have the edge over nonparticipating companies in the talent roundup next June.

Empty Pockets—It cost a college about $5000 to educate a student in 1949. It costs twice that much today. Yet when educators dip into their pockets for the extra money, they come up empty-handed.

The declining value of the dollar has taken the frosting off income from endowments. College administrators, afraid of pricing able but dollar-short students out of the classroom, have dared to raise tuition and fees only 26 per cent.

More than half our colleges and universities are forced to operate in the red. Hardest hit are private schools not supported by taxes.

Downhill—Without support from industry, the problem will get worse. Time won't cure this one.

In the next ten years, more than a million additional students will flood campuses. Facilities will have to be expanded to take them. Degree-granting institutions say they'll need $500 million annually above what they're getting now for the next ten years to meet rock-bottom requirements of maintenance and growth.

Dilemma — No wonder many executives consider support of higher education a necessary cost of doing business.

Unless an already heavy industry investment in this "training department" is protected, only two bad choices remain: The colleges can continue to go downhill financially (guaranteeing inadequate know-how for tomorrow), or the schools can turn elsewhere for help. That means government, and few industrialists like that idea.

Where Do You Start?

Investing in education is like life insurance. No one has a formula for the perfect program, nor can anyone tell you how much to go for.

How Much?—In 1955, the average corporate investment in education was about 1 per cent of net income. It's a recommended starting place for any program. This normally doesn't include fees paid to colleges for research or consultation. They're usually written off as business expense.

Corporations can get a federal income tax deduction on 5 per cent of net income for charitable contributions, including educational grants. The company paying a 52 per cent tax could make a $10,000 investment in education at a net cost of only $4800.

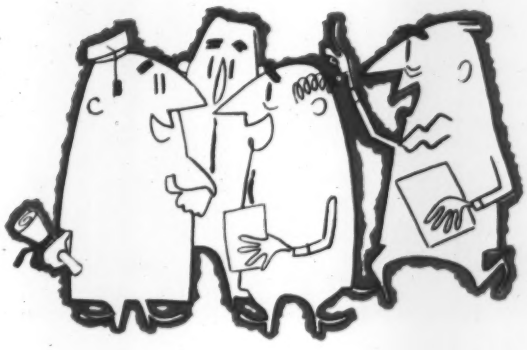
Many states also allow a deduction.

The Plan — The first step in building a program should be a written statement of objectives.

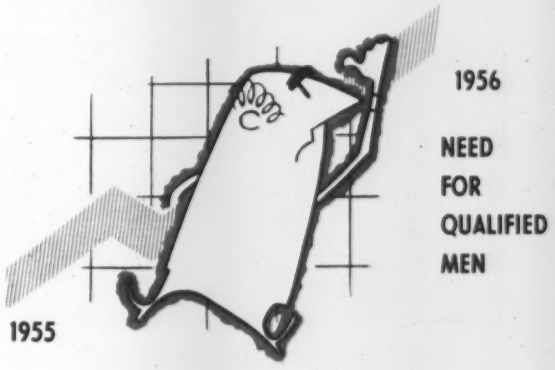
Budgets—Here are some suggestions that can be adopted to fit almost any company program:

If your budget is less than $5000, invest it within your locality or area. By working closely with a neighboring school, you get the

A Problem on the Increase



Industry is short of trained men. In 1956 it made more than five offers per graduate. There were at least twice as many openings as there were graduates.



As the complexity of industry goes up, so does the demand for qualified men. On one campus, offers jumped 40 per cent from 1955 to 1956.

advantages of good community and public relations, plus improved relations with the school and its graduates.

On a budget of $5000 to $10,000, the list of schools can be expanded (as through a state college association). Another possibility: Expand the function of the investment by putting some into unrestricted funds for the school, the rest into scholarships plus cost-of-education supplements. You also might broaden the base of your investment by contributing nationally through an agency such as the American College Fund, which distributes according to your wishes without cost to you.

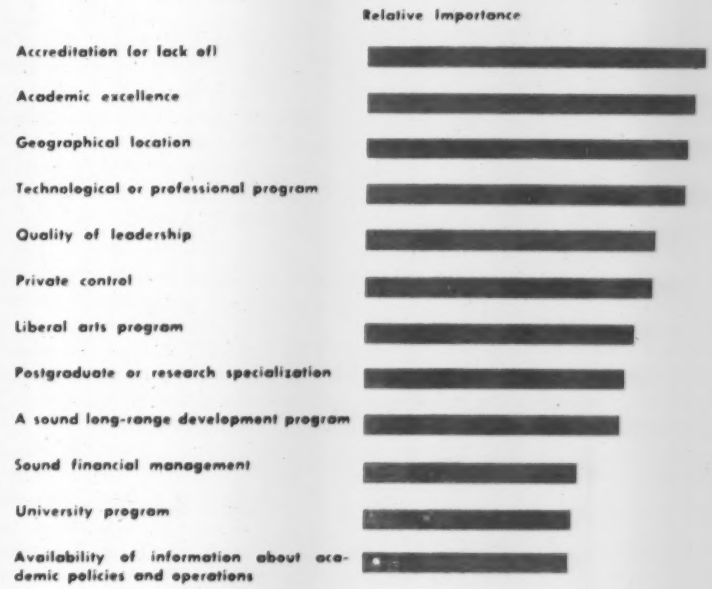
Corporations investing $10,000 to $50,000 nearly always extend the program beyond local schools or students. Contributions to state college associations come from these and larger budgets. (For information on associations, contact the Commission on Colleges & Industry, Association of American Colleges, 1407 Merchants Bank Bldg., Indianapolis 4, Ind.).

If you can invest more than $50,000, you may want to consider

Who Gets It?

• How do you pick a school? What factors should be important to you as a donor?

A survey of 81 business concerns shows a dozen (below) to be the most important. The top two, nearly equal, reflect interest in the general caliber of the institution. Geographical proximity is a close third.



Source: Council for Financial Aid to Education

Co-Operative Education . . .

spending on a nationwide basis, concentrating in localities where corporate interests are high. Also consider funds for specialty interests of the company—say schools of engineering and business administration.

Administration—Most programs are guided by top management teams. Experts warn against assigning one man the full responsibility and authority.

If the budget has more than $50,000 in it, consider establishing a corporate foundation to handle it. You'll get these advantages: Better administration with a full-time staff, tax advantages and stability of investments from year to year. A disadvantage: Money transferred to the foundation can't be brought back into the company.

Directions — The main avenues for support are: Funds for current operations, special services, capital funds and student aid. A 1954 survey showed corporations preferred them in the order listed, with an overwhelming preference for the first named. Schools also preferred funds for current expenses over others, but they put capital funds in second place, student aid money in third place. Whatever your preference is, here are the major alternatives for direct investment.

Current Operations

United States Steel Foundation Inc. is giving $300,000 to Northwestern University, the University of Chicago and Illinois Institute of Technology. They'll each get $100,000 in unrestricted grants.

Inland Steel Co., Chicago, will give $35,000 in unrestricted funds to six schools.

Kaiser Aluminum & Chemical Corp., Oakland, Calif., is giving $39,000 in unrestricted funds.

American Can Co., New York, is giving $300,000 over the next five years to a group of private schools. It's earmarked for faculty salaries.

These grants, and others like them, are designed to help educators eliminate deficit spending with a balanced budget.

Paradox—The kind of gift which is the most useful to schools also is usually the toughest to get.

Many industrialists like to invest money in projects where they can retain complete or partial control, not only of the funds but of the project itself.

But the director of one of industry's largest educational funds points out that there "is and must be increasing recognition of the fact that educators are every bit as honest, interested and capable in their business as industrialists are in theirs." He champions the necessity of increasing the investment and leaving educators in charge of school economics.

Specifics — Restricted investments agreed on by both the giver and recipient are also close to the hearts of school administrators. They are resolved in meetings between industry donors and educators.

Administrators outline needs. Company management picks items in which it wants to invest. Although the educator is given full control over his institution and its economics, management has a choice of investments. Of equal importance, such an arrangement stimulates improved communication and a closer relationship between industry and the schools.

Special Services

Inland Steel Co., Chicago, and Purdue University, West Lafayette, Ind., started on a program for Inland's plant employees in 1949. Twice a week, classes of about 65 meet at Purdue's Hammond, Ind., branch to learn about steelmaking, mechanics or electricity. It is a two-year course. The company picks up the tab, tells its employees there's no guarantee of promotion on completion but that the courses

will help them learn more about their jobs. More than 380 have been graduated.

A program in basic economics worked out by the Industrial Relations Center, University of Chicago, is taught to supervisors at Republic Steel Co., Cleveland. The course is a series of conferences on the principles, acts and functions of an economy like ours.

The same institution has worked out a cost reduction program for a leading railroad. It also developed an instruction series on retirement planning and preparation for employees at Bell & Howell Co., Chicago. The company switched from voluntary to compulsory retirement. W. L. Johnson, vice president of industrial relations, says: "We wanted to make the new program palatable. Now, the sessions and discussions we hold help employees understand and prepare for retirement."

Projects like these, tailored to specific needs, may cost from $10,000 to $50,000. Some have been packaged, and can be purchased for much less. The retirement planning program, for example, has been polished and standardized by the Industrial Relations Center. About $1700 covers instruction and material for 100 employees.

Research—One of the oldest co-

Working in the research department at Cincinnati Milling Machine Co., Bill Rogers runs drilling experiments to study chip formation and machinability. When his seven-week stint with the company is completed . . . he reports back to the University of Cincinnati where he's studying metallurgical engineering. In the machine-tool-conscious city, Miss Gay Havlin (center) works at Lodge & Shipley Machine Tool Co., Ed Hofstetter (at left with hand raised) co-ops with R. K. Leblond Machine Tool Co.

Welds Theory to Practice

• BILL ROGERS is a co-operative student in the University of Cincinnati's school of engineering.

In seven weeks, he will shelve his textbooks and report to the Cincinnati Milling Machine Co. for another seven in the company's metal-cutting laboratory. He'll have a chance to interpret textbook and classroom know-how in terms of on-the-job application.

Head Start—A junior, Bill has been on this program three years. At graduation, he'll have a degree in metallurgical engineering. More important, he will have a head start in putting his learning to work in industry. The break-in period will be shortened—perhaps eliminated.

Bill is typical of 89 co-operative students working for Cincinnati Milling. (Of these, 59 are from the U of C, where co-operative education was born 50 years ago.) Frederick V. Geier, the company's president, explains it's an investment in tomorrow's skills and know-how.

Procurement—D. F. Pratt, director of the company's training programs, says he uses two methods to select students. First, H. C. Messinger, director of the co-ordination department at the university, recommends qualified boys who want to work at the "Mill." The company's training committee does the selection. About 20 a year are accepted.

Second, Mr. Pratt contacts boys before they register at college, to give him first crack at high school graduates.

Curriculum—Students go through a 3000-hour training program, working in many parts of the plant. By the time they're finished, they are familiar with the company's products, production equipment and techniques; they have worked in engineering departments and laboratories.

Dividends—Mr. Pratt emphasizes: "If you're willing to calculate training costs as a long term investment, it pays handsomely.

What he says is probably true. The company's long list of U of C co-op graduates includes: Chairman W. W. Tangeman, two vice presidents of the parent company and five vice presidents of the sales subsidiary. About 75 graduates are working for the company.

Widespread—U of C has about 3400 co-op students working with 552 firms. Most are in the Cincinnati area, but some are as remote as Trona, Calif., Dallas and Boston.

Nearly 40 other colleges and universities offer the co-operative plan. Mr. Messinger says there's one rule for becoming a co-operating company: Express your desire to participate. From then on, the college will see that you meet students who want to work for your company or in your area. Your chances are better, of course, when you work with a college in your locality.

Ralph Brown, Selas' works manager, shows high school science students how a gas-fired drying furnace is built for the roofing industry

Industry Starts with the High School

CONVINCED that the lack of science courses at the high school level is a prime cause of today's critical shortage of engineers, Selas Corp. of America, Dresher, Pa., is tackling the problem in its community, a short distance outside Philadelphia.

Frederick O. Hess, president, says: "To help in a minor, but possibly important way, we elected, as a starter, to provide our local high school with an engineering library. It can be of assistance to the teachers, but we hope it will interest the student and stimulate him toward the broad and fascinating aspects of engineering."

Mr. Hess points out that only 50 per cent of high schools offer courses in physics and chemistry . . . only 24 per cent of our high school students study algebra, only 11 per cent take geometry.

Augmenting its library program, Selas encourages groups of science students and their teachers to visit its plant and watch engineers at work.

---

operative techniques is the research grant, either pure or applied. American Can Co. spent $42,000 last year for this purpose.

Dow Chemical Co., Midland, Mich., will spend about $160,000 this year for specific research, including consultation with college faculties.

Institutions with trained scientific personnel and ready access to information in all fields are excellent field labs for industry.

Research farmed out to schools often returns a direct benefit to the investor in terms of better products or broader applications for them.

Capital Funds

In 1955, Ford Motor Co. gave $414,000 in grants and gifts of automotive equipment to technical schools. A Ford fund gave $340,000 for buildings and other physical equipment.

Such funds are needed to enhance endowment income and expand facilities for the anticipated increase in enrollment. The student population will advance from 2.5 million to 3 million by 1960. Based on population increases alone, it should hit 5 million by 1970. Add the growing popularity of a higher education for all, and you come up with a figure which will top 6 million on that date.

Providing for the inevitable is a must.

Student Aid

This year, 27 scholarships worth $500 to $700 each have been awarded by Dow Chemical Co. They go to upper classmen at 15 schools.

Maytag Co., Newton, Iowa, invested $14,390 in local high school graduates and the offspring of employees last year.

Thompson Products gives ten $950 scholarships at Case Institute of Technology each year. One is for a freshman, two for sophomores, three for juniors, and four for seniors.

Scholarships (and fellowships for graduate students) are aimed directly at the shortage of well trained personnel. They are a direct solution to the problem of quantity.

The most important recent trend in scholarships has been the cost of education supplement. Realizing that scholarships normally are pegged to student costs like tuition, books and fees, donors are grant-

ing funds which make up what the school would lose on the student.

Utica Drop Forge & Tool Corp., Utica, N. Y., gives three $600 scholarships a year to nearby Hamilton College, Clinton, N. Y. The company also adds $600 to each scholarship to cover additional costs.

Let the school select scholarship recipients. This doesn't mean that you don't have anything to say about it. Many companies, like Thompson Products, let the school make recommendations. Company management makes final selections. Companies, anxious to stay out of the education business, recognize that the educators themselves are best qualified to pick deserving and qualified students.

If the scholarships are granted in your area, try to arrange summer jobs for the students. They'll get to know your company better, and you'll have a good chance to evaluate them. It may pay off at gradation. Warning: Educators and industrialists alike advise against putting strings (such as working agreements) on the scholarships.

Check, too, to see if you can aid through trade associations to which you belong. Many, like the American Society of Tool Engineers and American Society for Metals, have full-time scholarship programs. The Foundry Educational Foundation reports a phenomenal 92 per cent of its scholarship students stay in the foundry business.

Returns—Mr. Black of Thompson Products says: "The price of the scholarship ($950) would be a poor investment if our only aim were recruiting." In fact, you may get more applicants than you have scholarships. His point: Some important benefits can't be measured.

Bethlehem Steel Corp., Bethlehem, Pa., ties its contributions directly to payoff. It gives $3000 (unrestricted) to a school for each graduate who comes to work for the company and stays on the job four months.

Direct returns are likely to run high on scholarships granted to employees or their families. Because of natural ties, the graduate may return to the awarding company. You make a further gain in employee relations.

Communications

Improved communications can pay handsome dividends for both sides.

Republic sponsors its six-week "Economics in Action" session at Case Institute of Technology every summer. Case runs the whole show, with Republic's approval.

About 50 economics and social science professors are treated to a series of lectures by top economists. They attend bull sessions with industrialists. This year they also studied the story of a Westinghouse appliance. They talked business with an appliance retailer, distributor, went to the appliance factory, talked to a machine tool builder, railroad man and, of course, got the story at Republic.

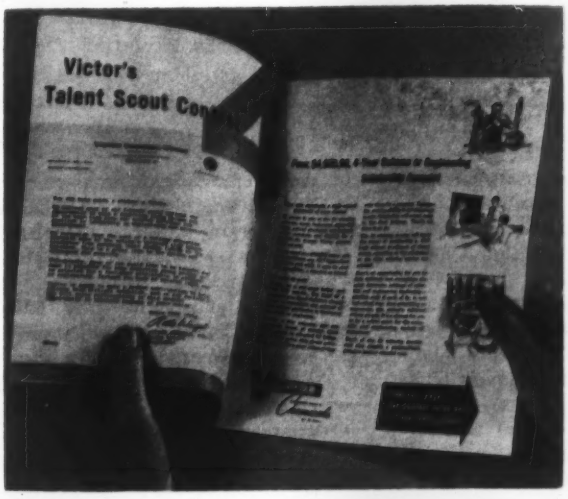
One Republic executive assesses the course this way: "It would be impossible to reach all the students, but we've talked to about 250 teachers in our first five sessions. That probably represents more than 10,000 students."

Consultation—GE augments its science fellowship program by placing some of its personnel and facilities at the disposal of the colleges. Company engineers, scientists and executives are called on to talk about their fields. Trips to laboratories and plants in the area of the schools are arranged to show teachers how important the subjects they teach will be to the future of their students.

Another direct way to get industry experience and understanding onto the campus is to provide summer jobs for professors.

Don't confine your thinking to

Contest Highlights Engineer Shortage



• EXECUTIVES at Victor Chemical Co., Chicago, recently placed a four-page advertisement in several industrial publications which introduces a "Talent Scout Contest."

Applicants are urged to: "Write, in a one-page letter . . . the kind of program you think industry should adopt to stimulate the interest of high school graduates in becoming scientists or engineers."

Results: 157 entries in the first three weeks.

Winners—Those who submit the 20 best entries (judged by a contest firm) will have the opportunity to nominate a student to receive a $4000, four-year scholarship. At Victor's expense, nominees will be brought to Chicago, where four winners will be selected by a committee appointed by the American Chemical Society.

E. M. Myers, Victor's advertising manager, says the company plans to share the best answers with industry. Many of the ideas may be useful in making educational investments.

Industry Trains Its Own at Wayne

• EACH EVENING a group of serious men and women files into a two-story brick building on a corner of the Wayne State University campus in Detroit. They are all from industry. Most of them are supervisors.

The building houses the industry-sponsored Materials Management Center. Clarence B. Hilberry, Wayne's president, has defined its goal as an aid "in building the men and women on the job who need further development as they face the challenging tasks of building our industries."

Light on theory, all classes stress practical approaches and solutions to jobs. Students can choose from 50 courses which cover subjects like material handling, scheduling, inventory control, distribution and traffic.

About 90 per cent of the instructors are from industry. The company usually foots the bill—about $25 a student per course.

Start—The idea came into being in 1950 when a group of about 30 Detroit executives saw the need and approached Wayne. Del S. Harder, Ford Motor Co.'s executive vice president, has been a guiding influence from the start. An industry committee of about 35 oversees the project, which is headed by Dr. Spencer Larson, its full-time director.

Sponsoring companies contribute from $100 to $15,000 a year to help finance the effort. They are expected to foot $80,000 of the $154,000 bill this year.

Case Histories—Kasle Steel Corp., Detroit, has put 11 to 14 supervisors through the program. In return, they have come up with an improved material handling system. Leonard Kasle, vice president, says: "We wanted our men to review modern techniques and equipment. We're sure the payoff over the long pull will be greater than we originally expected."

Rewards may come quickly. Harry Hunt, superintendent of shipping at the Burroughs Corp., attended the original session in 1952. He picked up an idea for a packing case. Replacing fibercord cells with 14 or 15 fittings, a new die-cut carton is saving the company $20,000 a year.

---

colleges. Dr. John R. Dunning, dean of Columbia University's school of engineering, points out that students often come to college poorly prepared. "Only about 4 per cent of our high school students are taking physics, for example."

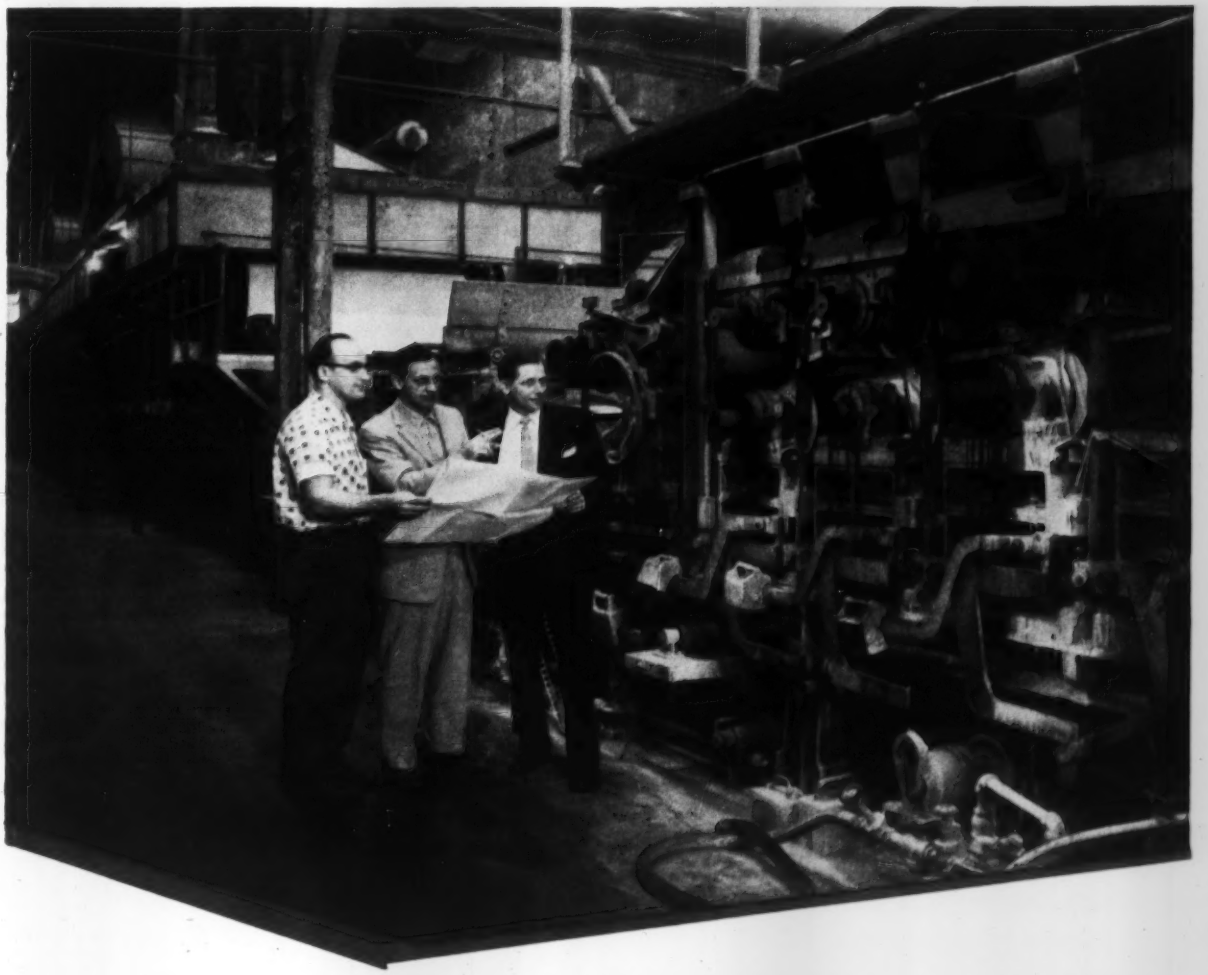
Best known of the high school-industry programs is Junior Achievement. It costs the company little (usually a donation to local JA headquarters) and returns big dividends in terms of community interest and the practical education the students get.

Guidance—Executives at Chambersburg Engineering Co., Chambersburg, Pa., grabbed the bull by the horns recently when they found only eight boys out of a local graduating class of 232 were qualified to enter engineering or technical schools.

Conferring with school authorities, they found career guidance took place in senior high, too late for some who might have wanted to study engineering. Guidance now begins in junior high school.

Conclusion — Without adequate support from industry, colleges will go downhill at a time when industry's needs for the college product are on the increase.

To protect an already heavy investment, and to meet tomorrow's certain needs, industry is lavishing attention on higher education, its outside training department.



how Bearings, Inc. goes to work for ...a boxboard plant

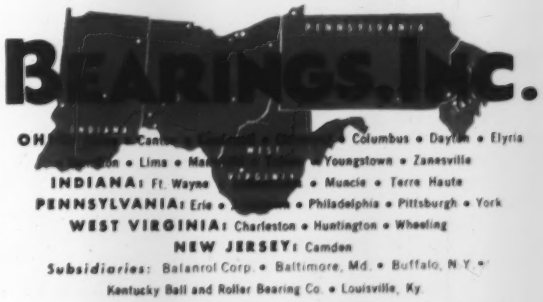
Here's service with a capital "S" as we see and practice it at Bearings, Inc.! In the photograph are: left, B. H. Weideman, Millwright Foreman; J. A. Rupp, Maintenance Superintendent of the Ohio Boxboard Company plant at Rittman, Ohio, and the Bearings, Inc. salesman, Jack Houser.

They are going over the final phases of a "bearing survey" Jack has been making for the company over the past six months. In this "survey" every bearing in every machine and pump in the Mill Division was located. The make, type, size and fit of over 4,000 antifriction bearings was determined.

The result of the "survey" has been very gratifying to plant executives. Information on every bearing is now at hand, instantly. Inventories of bearings are being steadily reduced and when the records show, to cite only one example, that 6 large, expensive bearings on 3 mills were identical except for a slight and unnecessary variation in internal fit, then no longer do they stock 4 replacements, 2 are plenty!

Do you need this kind of Bearings, Inc. service in your plant? We'll soon tell you . . . all you have to do is ask, no obligation of course.

Rendering bearing service in the territories adjacent to our branches, listed below.


PENNSYLVANIA
BEARINGS, INC.
OH
Columbus • Dayton • Elyria
Lima •
Youngstown • Zanesville
INDIANA: Ft. Wayne
Muncie • Terre Haute
PENNSYLVANIA: Erie •
Philadelphia • Pittsburgh • York
WEST VIRGINIA: Charleston • Huntington • Wheeling
NEW JERSEY: Camden
Subsidiaries: Balanrol Corp. • Baltimore, Md. • Buffalo, N.Y. •
Kentucky Ball and Roller Bearing Co. • Louisville, Ky.

JONES & LAUGHLIN INTRODUCES

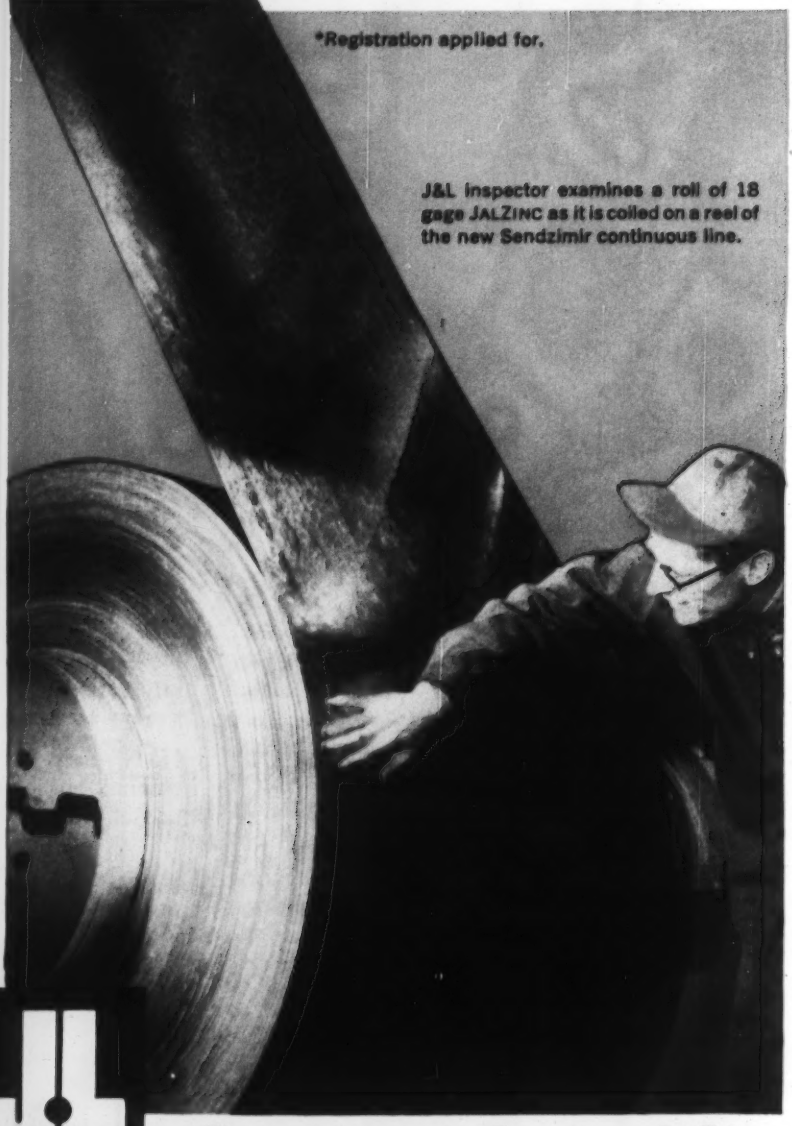
JALZINC*

*Registration applied for.

JALZINC is Jones & Laughlin's new trade name for its *high quality* zinc coated steel sheet and coiled product. JALZINC answers your toughest forming, rolling and drawing problems.

Produced by the proven Sendzimir process, JALZINC has a tight, uniform coating that resists cracking and flaking. The high lustre finish greatly improves the appearance of your end product. JALZINC is available in a wide range of gages and widths in both cut lengths and coils.

Users are enthusiastic about JALZINC'S uniform ductility, flatness and surface finish. Write today for complete details.



J&L inspector examines a roll of 18 gage JALZINC as it is coiled on a reel of the new Sendzimir continuous line.

Jones & Laughlin Steel Corporation
Dept. 404, 3 Gateway Center
Pittsburgh 30, Pa.

☐ Please send literature on JALZINC
☐ Please have J&L representative call

Name_____

Position_____

Company_____

Address_____

City_____ Zone_____

State_____

J&L STEEL

Jones & Laughlin
STEEL CORPORATION · PITTSBURGH

Technical Outlook

SUPERTEST— A test facility which can spin steam turbine and generator rotors weighing 85 tons 200 per cent above their normal speed will be built by General Electric Co., Schenectady, N. Y. It will evaluate the effects of abnormally severe operating conditions on the properties of materials and design features of rotors.

NEW FINISH— "A new type coating which looks and performs more like porcelain than any other organic finish" is the way Pittsburgh Plate Glass Co., Pittsburgh, describes its Duracron enamel. Based on new thermosetting acrylic resins, it's particularly suited for refrigerators, laundry and air conditioning equipment. Outstanding properties are toughness, mar resistance, adhesion, durability and one-coat performance.

TWIST DOES IT— The rotating floor brush in the familiar upright vacuum cleaner uses several spiral brush sections. Hoover Co., North Canton, O., wanted them diecast with holes for the brush tufts. Die design was solved by casting the base straight with the holes in a straight line. After the tufts are inserted in them, the castings are twisted. Presto: The correct spiral shape!

PRESSURE— The high pressures used in industry and research are outstripping our methods of gaging them, the National Bureau of Standards fears. It is attempting to develop instruments and standards that will permit more accurate measurement of pressures up to 200,000 psi. New fixed pressure points in the higher pressure regions also have to be determined to assure the accuracy of master gages.

TITANIUM HONEYCOMB— Titanium strip rolled to thickness of 0.001 in. is being made by American Silver Co., Flushing, N. Y. For use in honeycomb structures going into aircraft and missiles, it's available in tolerances as close as ±0.0001-in., in widths from ⅛ to 6 in.

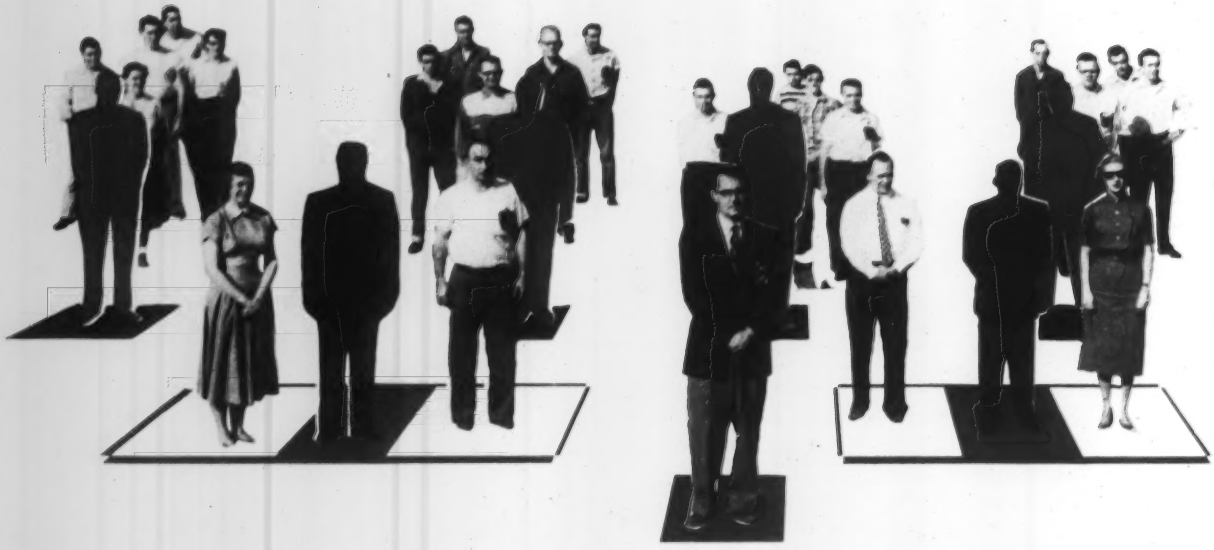
UNITY— E. E. Underwood of Battelle Memorial Institute, Columbus, O., has worked out a straight line relationship between tensile strength, flow stress, creep strength, hardness and temperature or time. Although the correlation was developed for single-phase alloys, it appears applicable to others.

WATER HEATER— A small heating unit protects electronic equipment from the ravages of high humidity for a penny a day. Made by Dampp-Chaser Inc., Hendersonville, N. C., it keeps air inside equipment about three degrees higher than room temperature.

NEW BOND— Duolock is the name given to a new system of bonding rubber to metal developed by the Adhesives Division, B. F. Goodrich Industrial Products Co., Akron. The company says the cost of using it is less than that of other bonding methods. Good adhesion is obtained over a wide range of curing conditions. The process works with natural and manmade rubbers.

WHOPPER— U.S. Steel Corp. says it has the world's biggest dynamometer. It's two stories high, weighs about 100 tons. It'll test improved railroad car wheels.

Metalworking Outlook—p. 73 Market Outlook—p. 177



Here's the way to organize a factory laboratory: Put your professionals in the key spots. Only those standing on solid squares are college graduates. The rest are nongraduate assistants

'I Have Enough Engineers'

By HIRAM BROWN
Chief Metallurgist
Solar Aircraft Co.
Des Moines, Iowa

SOLAR Aircraft is beating the engineer shortage.

Instead of wasting talent on routine tasks, engineers are assigned to key positions. Assisted by carefully selected technicians, a few professionals do the work of many.

In our factory laboratory, for instance, more than two-thirds of the personnel are technicians. The system works perfectly. Its results have been approved by the Air Force.

And we're enjoying a bonus: Professional engineers are happier; they have authority, responsibility and an opportunity to apply their talent.

It Depends—It's surprising what can be done with non-technical raw material, but benefits aren't automatic. The success of our plan depends on: 1. An organizational layout that spells out the duties and responsibilities of each man. 2. A system of procedures that specifies how routine chores should be performed. Used together, they'll give good results.

Organization

Here's the way the sytem operates in the factory laboratory at Solar, and a few suggestions about adapting it to your operation.

The positions shown in color (above) are filled by technical graduates. The others are lay assistants: Get them from trade schools or train them yourself.

These are some of the basic qualifications needed for each position:

A manager needs experience, and it helps if he has his master's or doctorate. He administers the laboratory program, establishes policy and is responsible for the operation. He trains one or two assistants (the chief chemist and chief metallurgist in our company) to succeed him or take over in his absence.

A chief metallurgist is responsible for the metallurgical section of the laboratory. He operates within the policies of the manager, keeps him up-to-date on research and development projects and troubles that may affect the quality or quantity of production. He checks the accuracy of technical reports from his section. Only graduate metallurgists, a few special investigators and clerks report directly to him.

The chief chemist's responsibilities parallel those of the chief metallurgist. Within the limits imposed by the manager, both men share the task of preparing procedures and promoting efficiency. Both contact customers, vendors and high level shop supervision.

Metallurgists—These men must be college graduates. Even if other supervisors report to them, their first job is to devise test methods, tools, programs for special problems, investigate new alloys and processes and act as trouble shooters. They must be able to write good reports and see that their recommendations are followed.

A system that puts professionals in key positions, trains technicians for routine work, can reduce the demand for engineers. Here's how one firm uses it in its factory laboratory

Chemists also must be college graduates. Where the group is fairly well knit (as in our analytical group), they supervise and perform specialized technical work. Where the group is spread out, a supervisor integrates each man's efforts.

Analytical methods for new materials, improvements of analyses and new processes are in the chemist's province. He also finds new ways to check the results of processing techniques.

Training — Chemists and metallurgists train their subordinates. At Solar, we believe in 1 or 2-hour weekly training sessions on company time.

Supervisors can be high school graduates. They should know a great deal about laboratory technology and be able to handle people. You must encourage additional education and on-the-job training.

Assistants and technicians from one or more sections report to a supervisor. He is concerned with leaves of absence, tardiness, vaca-

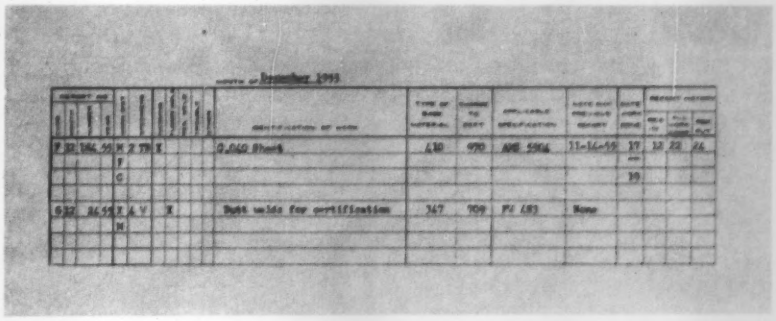
Without written instructions, the system the author describes would be seriously handicapped. Too much supervisory time can be spent in personal direction. Telling a man what he must do and how to do it begins with a manual similar to this example . . .

TITLE: FACTORY LABORATORY MANUAL - INTRODUCTION
BY No. Preface
ISSUE No. 3
DATE 6-16- 1955
PAGE 5 OF 8
SUPERSEDES 1-4-54
DIVISION: Quality Control (Factory Laboratory Department)
PLANT: Des Moines, Iowa

7. SUBJECT INDEX

Subject	Date Issued	Classification
Acid-Base Number of Petroleum Oils by Titration	11-22-52	0.020
Acid Muriatic, Inhibited for General Cleaning, Process Control Procedure	10-15-53	0.025
Alkaline Cleaning Tanks - Process Control Procedure	4-20-54	0.100
Alkaline Cleaning of Metals - Process Specification	10-1-53	0.105
Aluminum Triple Spot Test (Thickness in Steel)	8-17-54	0.170
Aluminum in Nickel Alloys - Mercury Cathode Method	2-18-54	0.188
Aluminum in Stainless Steel - Gravimetric	9-2-52	0.190
Atmosphere for Furnaces - See Furnace Atmosphere Control		
Aluminum in Steel 8-Hydroxyquinoline - Gravimetric	3-18-54	0.191
Aluminum in Titanium - Cupferron, Gravimetric	5-26-54	0.200
Beckman, Model B, Spectrophotometer - Operating Procedure	9-2-52	0.560
Boron in Steel, Colorimetric by Quinalizarin	2-11-54	0.740
Boron in Steel - Titration	6-30-53	0.745
Brazing of Heat Resistant Alloys-Process Specification	3-22-54	0.800
Butyl Acetate Vapor in Atmosphere	6-19-53	0.805
Cadmium Plating Thickness - Drop Test Method	10-10-52	0.930
Cadmium in Silver Solder - See 7.375		
Carbon in Steels by Combustion - Gravimetric	9-2-52	0.985
Carbon Monoxide in Atmosphere	10-10-52	0.995
Chlorides in Titanium & Titanium Alloys - Volumetric	9-22-52	1.020
Chlorinated Hydrocarbons in Atmosphere	10-20-52	1.035
Chromium in Steel - Volumetric by Ceric Sulfate	9-15-52	1.090
Chromium in Titanium & Titanium Alloys - Volumetric	9-24-52	1.105
Cobalt in N155 - Colorimetric by Nitroso-R	5-20-54	1.185
Cobalt in Steels - Gravimetric	9-22-52	1.195
Columbium in Stainless Steels - Gravimetric	1-10-55	1.230
Columbium & Tungsten in High Alloys	10-1-52	1.235
Columbium & Tungsten by Cupferron, Gravimetric	2-12-54	1.236
Copper in Silver Solder Electrolytic - See 7.375		
Copper in Steels - Colorimetric	11-11-52	1.280
Copper in Steels - Colorimetric by Rubeanic Acid	8-7-53	1.281
Copper in Steels - Gravimetric	9-2-52	1.290
Cyanide Content of Ajax Heat Treat Furnace Process Control Procedure	9-17-54	1.390
Deflocculator for Paint Booths - Turco #2183 Process Control Procedure	9-17-54	1.429
Degreasing of Metals with Vapor-Phase, Process Spec.	9-18-53	1.430
Degreasing Fluid, Trichlorethylene-Process Con. Proc.	9-29-53	1.433
De-ionized Water from Illco-Way Model L-12 - Process Control Procedure	8-26-54	1.440
Descaling Tanks, Cold Acid-Process Control Procedure	10-24-52	1.450
Descaling of Metals in Cold Solar Acid - Process Spec.	9-17-53	1.455
Descaling Tanks, Hot Acid (140° F) - Process Con. Proc.	10-23-53	1.460
Descaling of Metals in Hot Acid - Process Specification	10-23-53	1.465

To keep track of material and check its progress, clerks use a log sheet like this one . . .



tions and the planning and scheduling of work loads. Supervisors help train their men, make some decisions on borderline cases which affect specification, check and sign all short form reports.

Chemical analysts should have a degree and at least six years of experience. They ought to work with a minimum of supervision and should check their own work.

Laboratory investigators don't have to be college graduates. Experience is more important here—several years in one or two specialized fields like welding, heat treating or machining are a big asset. Each works as a free lancer under the chief metallurgist or chemist. A practical man does well at liaison work between shop and lab, and has a good chance to check the effects of technical recommendations.

Technicians—High school graduates are adequate for these positions, although several years of shop and laboratory experience are a prerequisite. They must attend on-the-job training classes, be a little more skillful than assistants and do some of their own planning. Some supervision is needed.

In the metallurgical section, technicians use microscopes, measure grain size, rate carbide networks, make stress-strain curves, interpret and mark x-ray films.

Laboratory assistants are technician trainees. As recent high school graduates, they get their training on the job. Duties are routine, with plenty of supervision; all work is planned and scheduled for them.

In the metallurgical section, assistants do the legwork, supply the muscle to operate testing equipment, polish metallographic samples. In the chemical section, they check pickle tanks, furnace atmospheres, soluble oils and fume conditions.

forms

For ordering the work and recording test results, use a multicopy form like this . . .

DISTRIBUTION:
Rec. Insp.
File
Purchasing (2)
USAF

Report: Metallurgical ___ Physical ___ Chemical ___

FACTORY LABORATORY

Date Received: 12-12-55 Requested by: John Smith Date Released: 12-24-55

Vendor: Snyder Steel Co. Heat No: XS 2 Spec: AMS 5504 Type: 410

Tests Required: Complete ☒ Partial ☐ Receiving No: RR IX

Special Tests: Per Spec. Customer: High Speed Inc.

Description: 0.040 Sheet Sample Size: 2" x 48"

Reference Report No. ---- which did (not) conform to specification.

CHEMICAL ANALYSIS

No.	C	Mn	P	S	Cr	Ni	Ti	Cu	Cb	V	Mo				
XS 2	0,10	1,10	,020	,020	19,10	0,15	0,20	Tr	---	---	0,15				

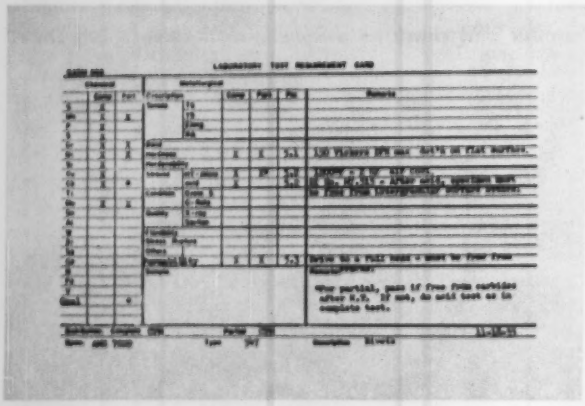
Do

John Doue
Chemist

METALLURGY

Spec No.	Heat No.	Tensile Strength	Elongation % in 2 in.	Hardness Hardenability	Bend Test	
	XS 2	87,000	21,0	C 42	OK	

Cards for each part put the information where it's needed. Here's the front and back of a typical card . . .



		Check Analysis Under Min	Over Max
Carbon	0.08 max	—	0.01
Manganese	2.00 max	—	0.04
Phosphorus	0.04 max	—	0.005
Sulphur	0.03 max	—	0.005
Chromium	17.00-19.00	0.20	0.20
Nickel	9.00-12.00	0.15	0.15
Silicon	1.00 max	—	0.05
Copper	0.50 max	—	0.03
Columbium & Tantalum	10XC-1.10	0.05	0.05
Molybdenum	0.50 max	—	0.03

Procedures and Forms

Communication is just as important as organization: Put the skill and knowledge of your professionals into usable form for technicians. That means manuals, forms, (some are illustrated here and on page 131) and an efficient clerical system.

Here are some of the things you need:

Laboratory Manual—This must cover all the parts you receive and make, giving analysis procedures, process specifications, physical and chemical testing methods, even the way you want reports handled. Each sheet is classified or coded for easy reference. And don't forget a thorough alphabetical and numerical index.

The manual is a joint effort that involves all professional personnel. In larger operations, a technical writer is invaluable.

A clerk keeps track of all incoming material. By using a specification sheet, he can tell what operations should be performed and the departments within the laboratory involved.

A log shows the status of work. Simple codes are used for the date received and the number of the shipment. Order columns show specs, what department has the material and the date the work was completed and results forwarded.

After the clerk fills out the log, a multiple copy report form should accompany the work. It serves as a request for work and a report. Spaces are provided for the vendor's name, heat number, specification and the types of tests required. There should be room for chemical and physical analyses and remarks. To complete the form, a supervisor marks it "O.K." or "not O.K." and signs it.

Battelle Memorial Institute

Use professionals for intricate, exacting tasks. Assistants can record and transcribe data, do routine calculation

Boeing Airplane Co.

Graduate engineers and their assistants should work as a team. This one is checking out a large tube bender

Card Files — Laboratory test cards are made for each part. The information is adapted from the laboratory manual and provides a ready reference for technicians and assistants.

A master heat card is maintained so that the chemical analyses of incoming shipments won't be duplicated. It's a good idea to cross-index the laboratory report number in case something was wrong with the previous shipment of a particular heat.

Keep a file of x-ray standards. Note the permissible defects, templates, exposure data and set up positions. (See STEEL, July 2, p. 66.)

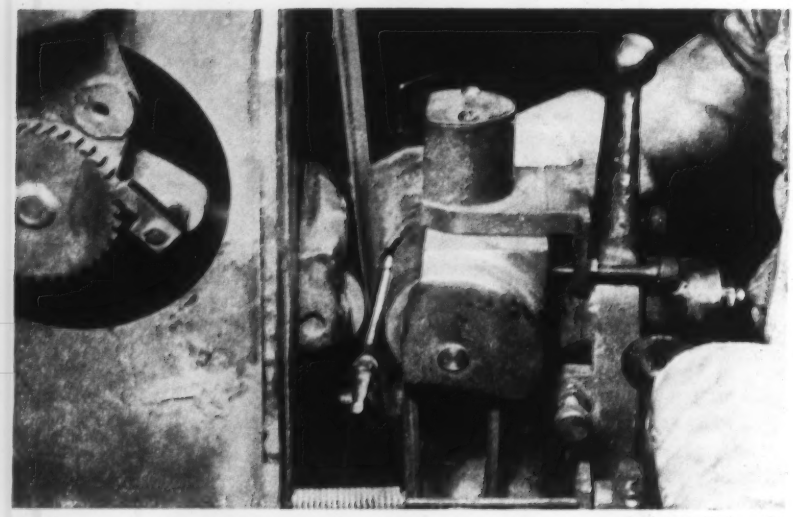
Look Ahead—Any system you select or devise probably won't work perfectly at first. Give it time.

Don't forget that engineers and graduate personnel are much happier with responsibility and authority.

A little of that thinking goes a long way toward cutting down labor turnover.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*

Developments in machinery have moved this method from finishing and polishing into big, heavy-duty league. Here are a few industrialists saw last week in Cleveland



Production Machine Co.

Here is a small, centerless-type grinder finishing an automobile gear shift lever. With solid platen and centers, it's capable of close tolerances

What's New in Coated Abrasives

WEEK before last some 4000 of the nation's industrialists gathered in Cleveland to eye the latest in coated abrasive machinery.

The metal finishing show was the brain child of management at Behr-Manning Co., Troy, N. Y.

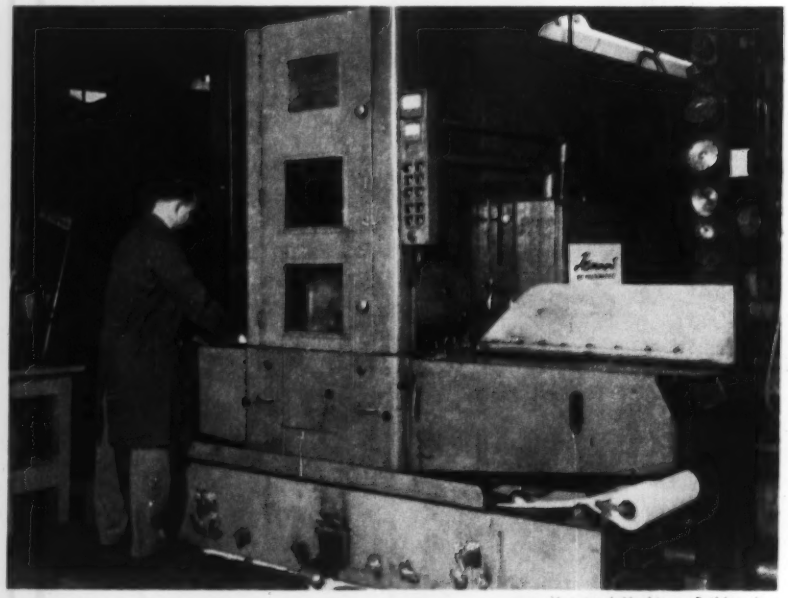
Thirty-four machine tool builders put more than 100 machines through their paces. Some, like the Engleberg Huller flat surfacer (opposite page) were shown for the first time.

Gallery — The equipment that got the most nods were abrasive belt versions of standard finishing tools, and surfacers and finishers that could be fitted easily into automation schemes.

Hammond Machinery Builders Inc., Kalamazoo, Mich., has a flat finisher (right) that cuts or polishes flat stock up to 12 in. wide. Work is laid on a horizontal abrasive belt. It carries the work under a vertical belt. The lower work roll is steel and will take pressures in excess of 25,000 psi—although abrasive belts won't stand more than 13,000 psi. The machine will take a 0.010 in. roughing cut from a cast iron workpiece at the rate of 100 ft a minute.

Speed — The centerless grinder (far right) is made by the Production Machine Co., Greenfield, Mass. Using the traversing fixture shown, an eastern firm grinds a 4-in. stainless steel tube at the rate of 12 ft a minute. Both Behr-Manning and the Greenfield firm state that belt cost is less than 10 cents per pound of metal removed.

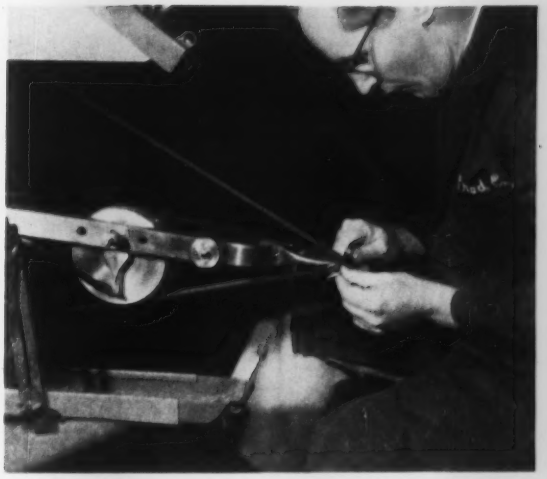
Behr-Manning emphasizes that the construction of coated abrasive belts is the reason behind the



Hammond Machinery Builders Inc.

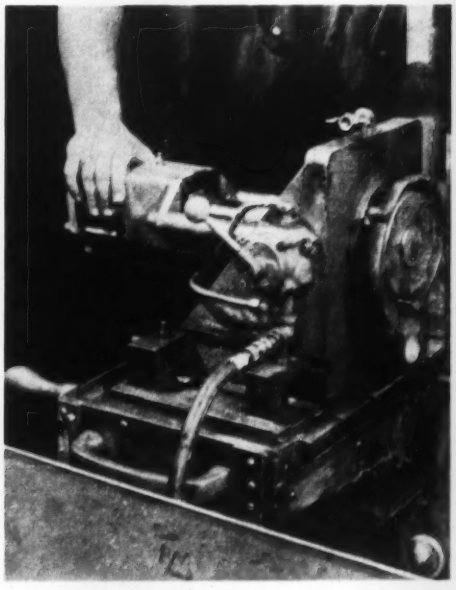
This flat finisher uses a 12 x 126 in., coated abrasive belt, housed in the vertical portion. The horizontal conveyor operates at rates up to 44 fpm

That's a special ($100) wheel for a Cadillac being finished ground with a swing sander (Bush Mfg. Co., Clawson, Mich.) The same type is indispensable for the sharp contours in tiny jet engine blades (right). (Stephen Bader & Co., Valley Falls, N. Y.) The idler wheel carries a backing strip made of felt

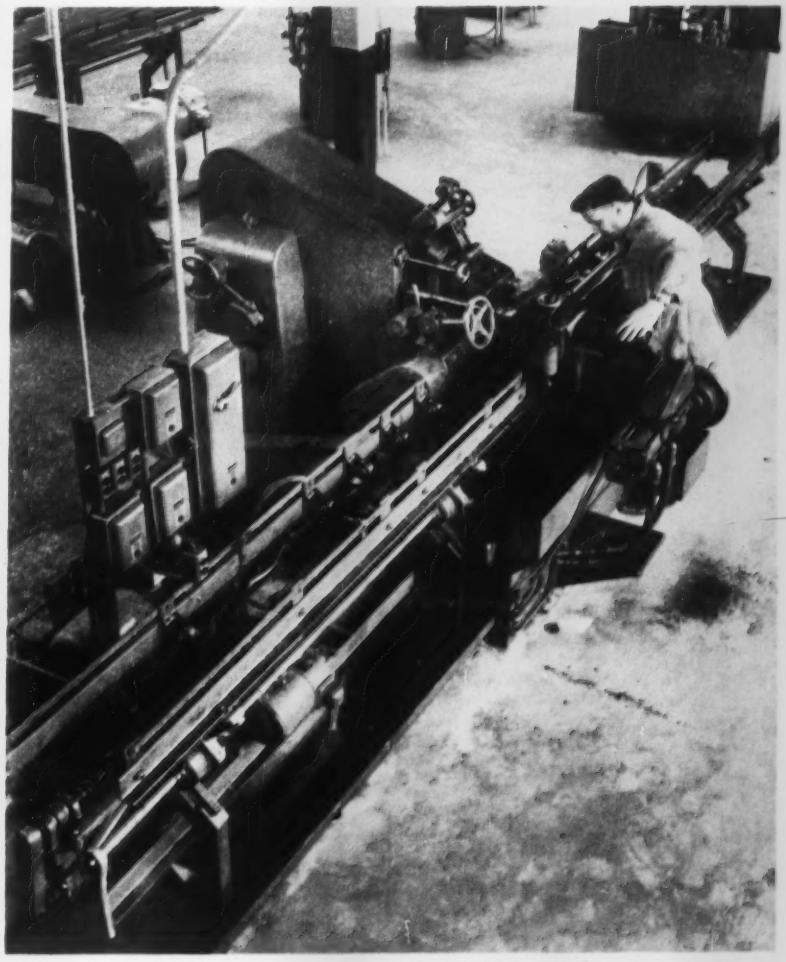


exceptional rate of stock removal. Abrasive grits used in the belts are long and narrow. By passing the belt through an electrostatic field during the coating process, most of the grains are oriented vertically, perpendicular to the belt surface. The grain edges are in a better cutting position without dressing or similar preparation.

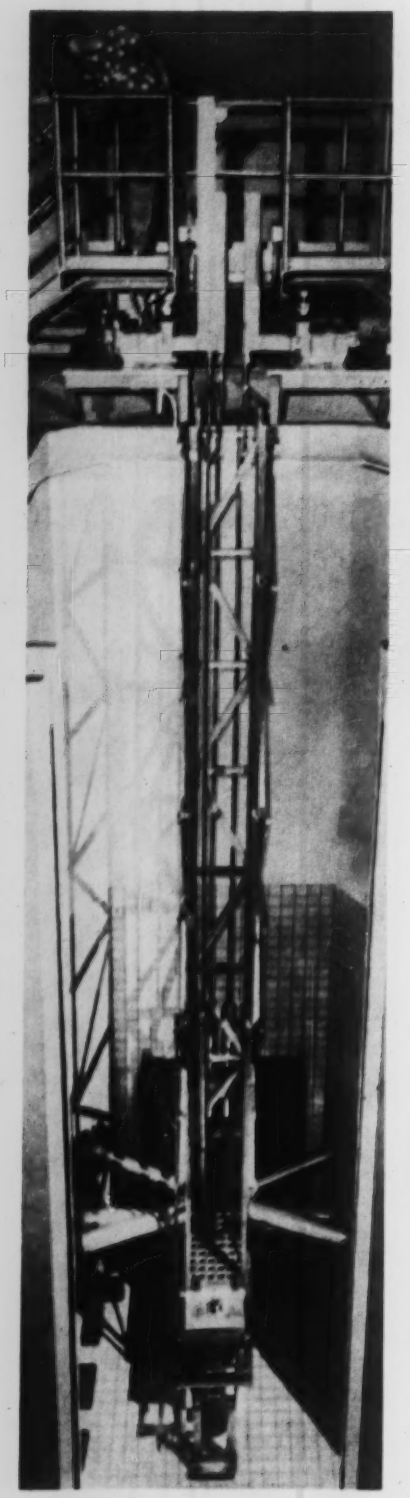
Various belt dressings and coolants can be used to cut down belt loading.



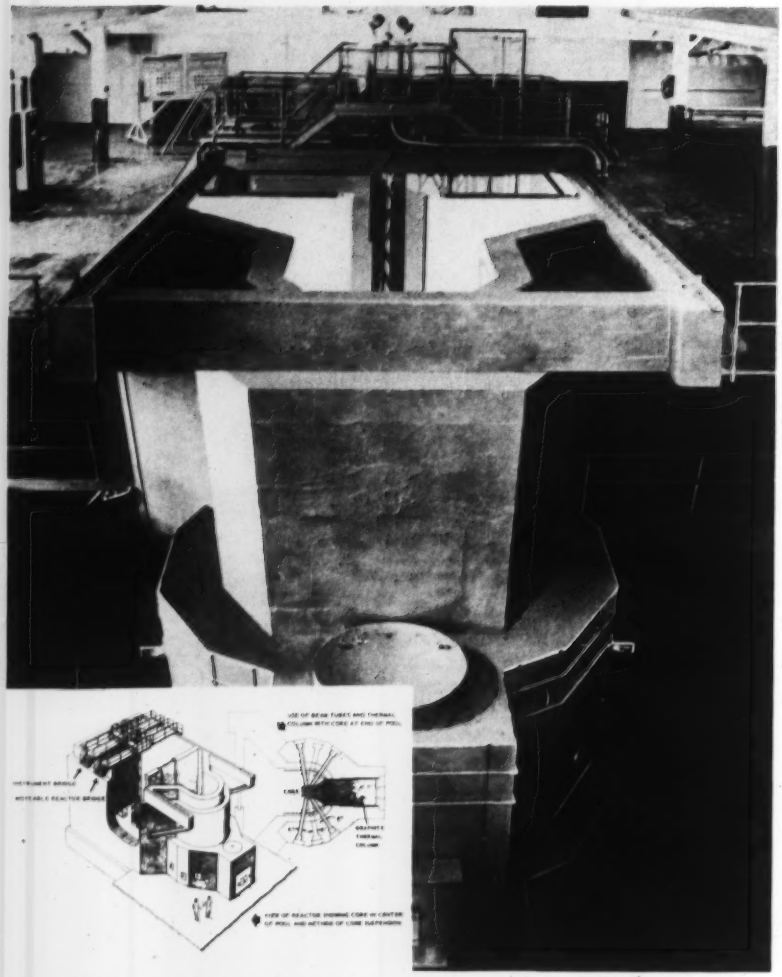
Wet grinding cast iron. This platen grinder (Engleberg Huller, Syracuse, N. Y.) takes off 1/32-in. in 1 minute



This centerless grinder uses a coated abrasive belt, handles tubes and bars up to 4 in. in diameter. Its maker, Production Machine Co., Greenfield, Mass., says it's being used for stainless, titanium and zirconium



The core of the reactor is located at the bottom of this suspension tower. Tubes, with specimens inside them enter from side of the pool and come up to the reactor core face. Radiation penetrates the tube and causes changes in the specimens



A pool of water, 20 ft wide, 40 ft long and 28 ft deep, holds the research reactor in which nuclear fission occurs. Core of the reactor has about 20 fuel elements, each 3 in. square and 2 ft long. The facility is being used to develop industrial uses of nuclear radiation and energy

Open for Research

LATE LAST month a 1 million-watt research reactor went into operation at Battelle Memorial Institute, Columbus, O. Designed for research, it is the "largest of pool type to be put into service in this country," states Dr. Clyde Williams, president and director.

It is basically a nuclear apparatus for producing gamma rays and neutrons. These two products will be applied in chemical, metallurgical, electronic and other research.

Part of a Nuclear Research Center, the reactor was built with Battelle funds. Battelle can contract with industry for nuclear research without government security regulations. Work will be in diverse fields, including ore processing, reactor metallurgy, power development, neutron and gamma irradiation effects.

The core, composed of uranium-235 fuel elements and boron control rods, is suspended 22 ft below the surface of a pool of highly purified water. The water serves as a coolant and as a shield to protect personnel from radiation. The reactor was designed by Battelle physicists and engineered and built by the Atomics Division of American Machine & Foundry Co.

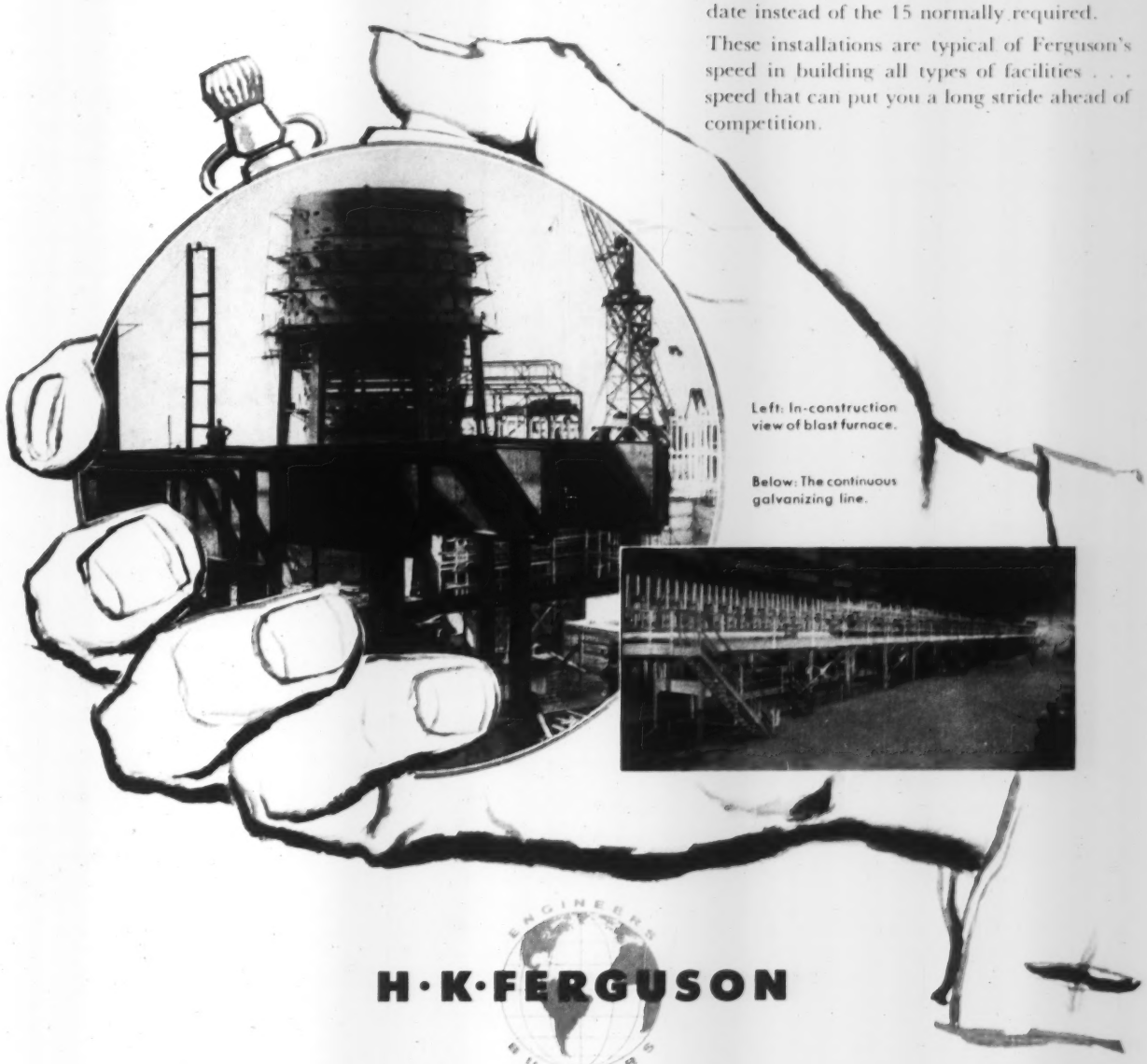
"4-Minute Miles"

Keep DOFASCO strides ahead

Dominion Foundries and Steel Limited, Hamilton, Ont., rightly reasons that the sooner an addition is operative the greater the jump on competition, the bigger the profits. The H. K. Ferguson Company in joint venture with Patterson-Emerson-Comstock, International has the task of building "faster than possible."

Record-time accomplishments at Dofasco include a continuous, fully-automatic galvanizing line, a cold reduction strip mill, a continuous electrolytic tinning line, a continuous annealing line. Each was completed *5 to 6 months faster* than what the steel industry considers a "good" schedule. And the blast furnace pictured soon will be in operation—9 months after starting date instead of the 15 normally required.

These installations are typical of Ferguson's speed in building all types of facilities . . . speed that can put you a long stride ahead of competition.



Left: In-construction view of blast furnace.

Below: The continuous galvanizing line.

H·K·FERGUSON

ENGINEERS BUILDERS

THE H. K. FERGUSON COMPANY

Subsidiary of Morrison-Knudsen Company, Inc.

Executive Office: Cleveland 14, Ohio. Other Offices: New York • Ft. Lauderdale, Florida • Cincinnati • Chicago • Los Angeles • San Francisco • Atlanta • Toronto • London, England

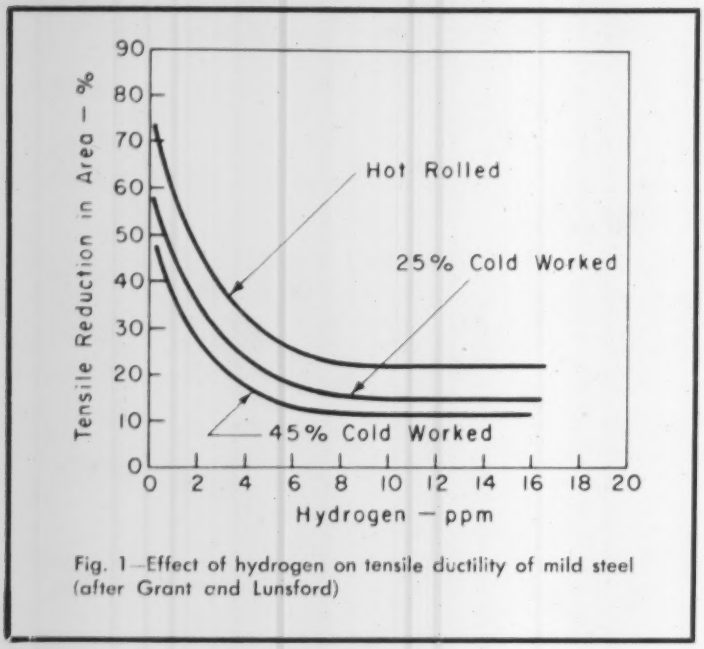


Fig. 1—Effect of hydrogen on tensile ductility of mild steel (after Grant and Lunsford)

The picture of a gas up to no good, as sketched before the recent Chicago Regional Technical Meeting of the American Iron & Steel Institute

Hydrogen Embrittlement of Steel

By W. ROSTOKER
Supervisor, Metals Research Department
Armour Research Foundation of
Illinois Institute of Technology
Chicago

HYDROGEN in iron and steel confers no good effects, only bad ones. Although it rarely exceeds 15 ppm, and more commonly falls between 1 and 10 ppm, control of these small levels is becoming increasingly urgent.

Unfortunately, hydrogen pickup can occur in many of the stages of manufacture. The most common are:

1. During melting.
2. During pickling or electroplating.
3. During heating or heat treating.

Melting—Liquid iron has an appreciable solubility for hydrogen. While most of it is evolved during solidification, the amount left in the solid solution can be more than ample to cause trouble.

Processes for degassing a melt all derive from the principle that solubilities of gas in a melt are less under vacuum or reduced partial pressure of the gas. Bubbling a hydrogen-free gas through the melt will scavenge hydrogen. The ore boil in the open hearth is effective in reducing the hydrogen picked up in the prior stages of the heat. But the reduction of the hydrogen content of a heat before pouring is not always practical from a cost viewpoint.

Another method is vacuum ingot casting. By housing the ingot molds in an evacuated chamber and by breaking the stream of molten metal into a multitude of droplets, conditions for rapid removal of hydrogen are created. In this instance, the rate of hydrogen evolution from the melt is proportional to the vacuum level, rate of pumping and the surface of the liquid drops.

Pickling — Surely the earliest awareness of hydrogen embrittlement came from problems associated with pickling and electroplating. Nascent hydrogen evolving from aqueous solutions is rapidly absorbed by iron or steel. Because of the surface infusion process, the hydrogen picked up in pickling or plating is largely concentrated near the surface in a steep gradient.

The solubility of hydrogen in steel at room temperature in the absence of an atmosphere of nascent hydrogen is much less, so on removal of the specimen from the bath, hydrogen effuses from the surface in measurable time.

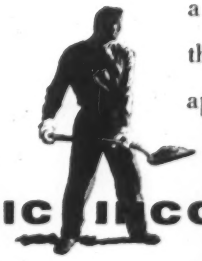
What is sometimes forgotten is that hydrogen diffuses into as well as out of a steel bar. The apparent brittleness of a steel part may increase with time before it begins to decrease. The location of points of embrittlement may depend on the initial distribution of hydrogen and the time elapsed

LOOK, GUYS, BIG SHOT NOW -- WORKED HERE TEN YEARS AND NEVER GOT OUT OF THE LABOR GANG.
TRYIN' TO SELL THE BOSS "BLACK STUFF" -- THE ONLY USE HE MADE OF IT HERE WAS TO SLEEP ON!
REMEMBER THE TIME DUTCH SENT HIM TO THE MACHINE SHOP FOR A TAP HOLE STRETCHER?
THAT GUY WORE OUT MORE SHOVELS LEANIN' ON 'EM THAN SHOVELIN'!
MANY THANKS TO AN ANONYMOUS CONTRIBUTOR.
KUEKES

The bad penny

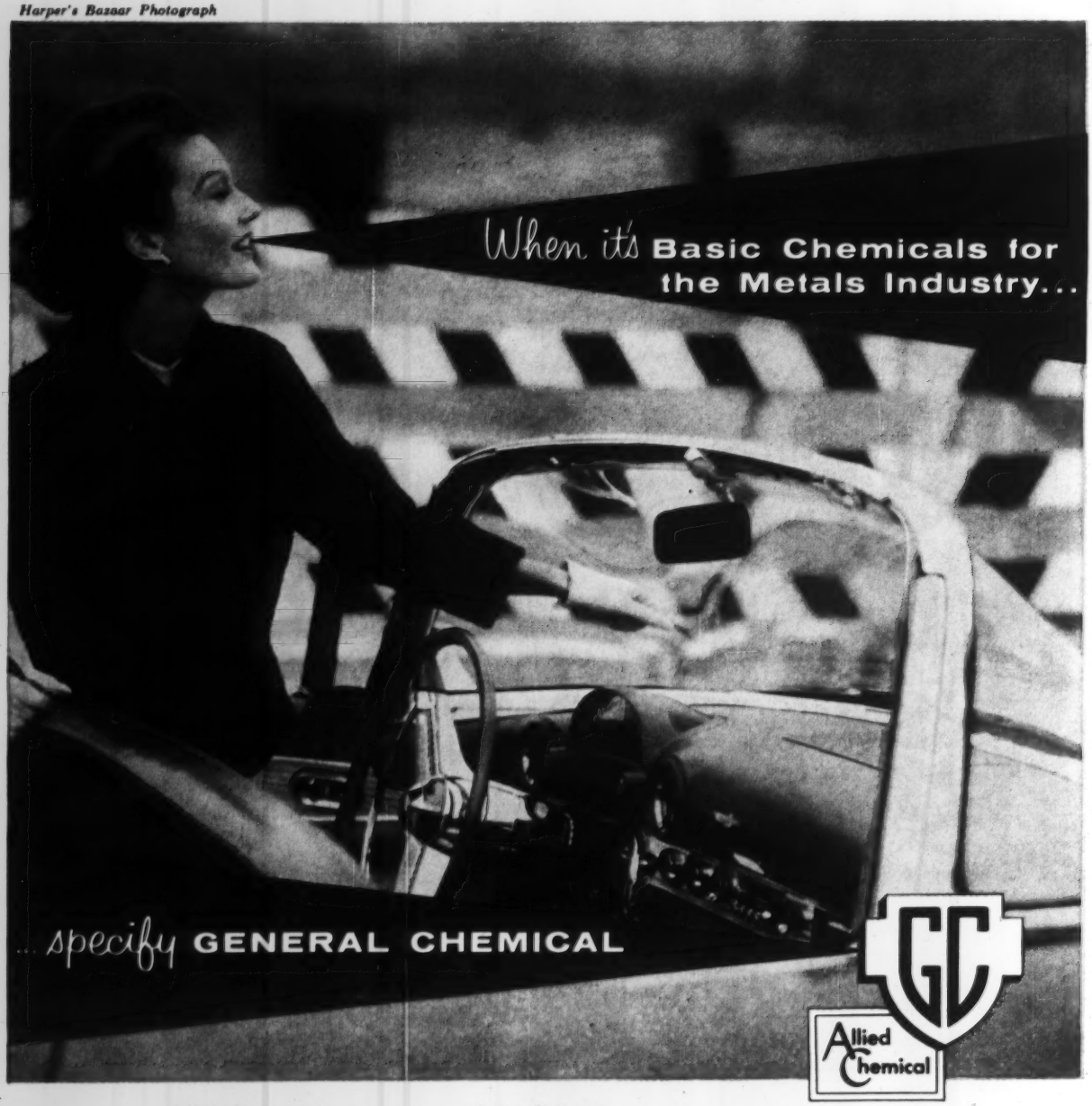
WHY NOT DESCRIBE YOUR OPEN-HEARTH CARTOON IDEA AND SEND IT ALONG TO US?

The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.



BASIC INCORPORATED 845 HANNA BUILDING • CLEVELAND 15, OHIO

Harper's Bazaar Photograph



Sulfuric Acid
Hydrochloric (Muriatic) Acid
Nitric Acid
Hydrofluoric Acid
Sodium Fluoride
Sodium Bifluoride
Trisodium Phosphate
Sodium Metasilicate
Oxalic Acid
Fluoboric Acid
Potassium Fluoborate

Sodium Fluoborate
Ammonium Fluoborate
Lead Fluoborate
Tin Fluoborate
Copper Fluoborate
Iron Fluoborate
Nickel Fluoborate
Cadmium Fluoborate
Other Heavy Chemicals

B&A Laboratory Reagents and Fine Chemicals

BASIC

CHEMICALS FOR

AMERICAN INDUSTRY

GENERAL CHEMICAL DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 Rector Street, New York 6, N. Y.

Offices: Albany • Atlanta • Baltimore • Birmingham • Boston • Bridgeport • Buffalo • Charlotte Chicago • Cleveland • Denver • Detroit • Greenville (Miss.) • Houston • Jacksonville • Kalamazoo Los Angeles • Milwaukee • Minneapolis • New York • Philadelphia • Pittsburgh • Providence San Francisco • Seattle • St. Louis • Yakima (Wash.)

In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

between exposure to hydrogen and testing.

Heating — The third source of hydrogen pickup is a hot furnace atmosphere containing uncombusted hydrogen. In fact, this is becoming the generally accepted research method for producing specimens with a controlled hydrogen content.

There are three categories of mechanical deficiency clearly attributable to hydrogen:

1. Reduced tensile ductility.
2. Flaking.
3. Delayed fracture or static fatigue.

In all three, brittle failure occurs at prematurely low stress levels. Distinctions among the three arise from different combinations of temperature, stress origin, strain rate and time.

Ductility — Conventional tensile testing at room temperature yields the trends shown in Fig. 1. Clearly, hydrogen profoundly reduces the tensile ductility of mild steel in any stage of cold work. The influence on other tensile properties is not so clear. For example, the effect of hydrogen on ductility has been so marked that little attention has been given to the effect on yield behavior.

At extremely low and slightly elevated temperatures and at high strain rates, the behavior of uncharged and hydrogen charged steels is undistinguishable. Impact testing cannot be used to discover hydrogen embrittlement.

Hydrogen embrittlement is not to be confused with the normal transition from ductile to brittle behavior exhibited by all steels with or without hydrogen. The hydrogen effect is actually a superposition on the basic temperature-strain rate behavior. This is easily appreciated from the isometric projections of Fig. 2.

Flaking—Hairline cracks, fissures, "fish eyes" or what may be generally termed internal ruptures have long jeopardized the expected endurance limits of large forgings. The same sort of flaw occurs at times in welds. Hydrogen is the evil agent.

It was discovered that the flakes will develop in a steel which has been incompletely transformed above the M_s temperature if the steel contains hydrogen. The resulting structure of ferrite, carbide (as pearlite or bainite) and martensite will crack internally on standing at room temperature for several hundred hours. The ingredients for flaking are an intrinsic hydrogen content, transformation stresses arising from mixed martensitic and nonmartensitic structures and time.

Flaking can occur in steels containing as little as 2 ppm of hydrogen; yet when transformations are deliberately controlled to completion above the M_s, abnormally high hydrogen contents can be tolerated without flaking. It seems apparent that the condition for flaking is a composite function of hydrogen content and transformation stresses.

Quench cracking and flaking can be regarded as part of the same picture. For it has been shown that hydrogen charged steels, quenched to fully martensitic studies, are prone to radial cracking. In this case, the stresses are thermal in origin and great enough to cause immediate rather than delayed rupture.

Fatigue—When we began to use steels with tensile strength levels of 200,000 psi and more, a hitherto unknown problem arose. Particularly in fasteners, brittle failure occurred in threaded sections after many hours of service and under static stress levels far less than the yield strength in tensile testing. The notched condition is implicit in delayed brittle failure, and the sharper the notch, the lower the endurance limit.

The hydrogen level for delayed rupture must be far less than for normal tensile embrittlement. From Fig. 3 it can be seen that, after aging at room temperature for 10 hours, the original tensile ductility can be fully recovered. Yet the same steel heat treated to the same tensile strength and pre-aged without stress for the same time shows severe delayed failure behavior with only a slightly raised endurance limit.

Considering the behavior characteristics of flaking and static fatigue, there seem to be good grounds for treating them as different facets of the same phenomenon. Both are essentially delayed rupture effects; both require abnormal hydrogen content and a critical stress. In the case of flaking, the origin of the stress is thermal or by heterogeneous transformation; in the case of static fatigue, the stress is applied externally and magnified locally by a notch.

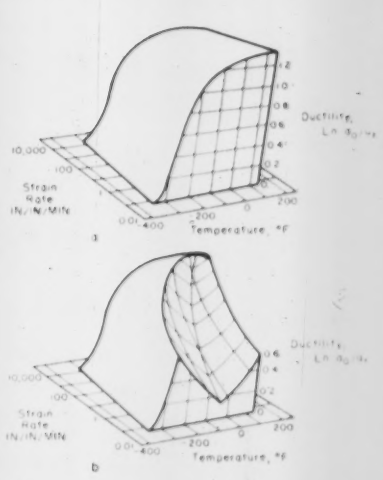


Fig. 2—Ductility of an SAE 1020 steel as a function of strain rate and temperature: Above—as annealed. Below—as charged cathodically for 1 hour in 4 per cent sulphuric acid (after Toh and Baldwin)

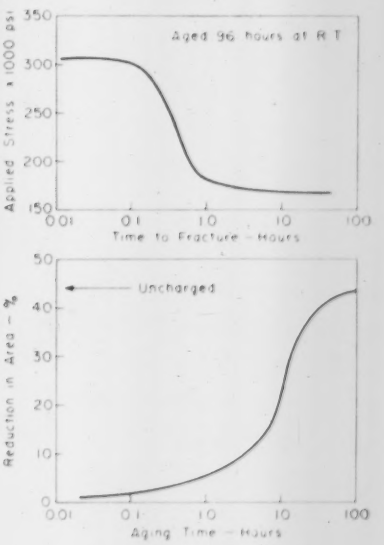


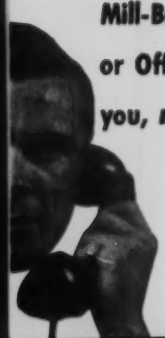
Fig. 3—Effects of aging on delayed failure and normal tensile ductility (after Frohmberg, Barnett and Troiano)

How?—We are still speculating about the means by which such small amounts of hydrogen produce such catastrophic results. It is

(*Please turn to page* 144)

Take a new

Call the Carpenter Mill-Branch Warehouse or Office nearest you, *now* . . .



Atlanta, Georgia
JAckson 3-6472

Bridgeport, Connecticut
EDison 6-1105

Buffalo, New York
REgent 0880

Chicago, Illinois
HAymarket 1-8085

Cincinnati, Ohio
REdwood 1-5088

Cleveland, Ohio
PRospect 1-4384

Dayton, Ohio
MIchigan 7456

Detroit, Michigan
TYler 5-0500

Hartford, Connecticut
JAckson 7-7174

Houston, Texas
(currently moving to new warehouse)

Indianapolis, Indiana
MElrose 2-5401

Los Angeles, California
LUdlow 7-9131

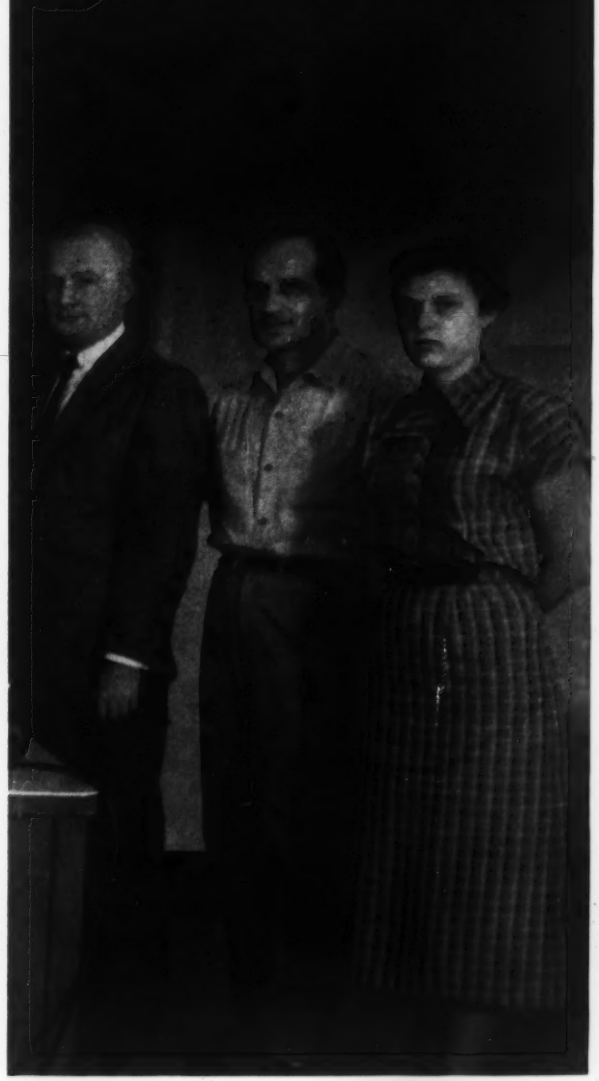
Louisville, Kentucky
GLendale 4-0115

Milwaukee, Wisconsin
UPtown 3-0530

Minneapolis, Minnesota
Regent 0908

Plus representation in other principal cities throughout the U. S.

look...



at the people waiting to go into action when you call

Have you called Carpenter lately?

When you do, we believe you'll find a *personal satisfaction* in getting the kind of specialty steel service you want and need today.

The people shown here are typical of the *specialists* in the Carpenter Mill-Branch Warehouse near you. Working as a team, they offer you increasingly better service on specialty steels.

Suppose, for example, you need fast delivery on a tool, stainless or alloy grade. From the man on the order desk . . . to the one who processes your order . . . to the man who delivers it — each one does his best to earn your business.

What's more, they're backed by unusually ample stocks of all grades and sizes of *Carpenter Quality* steels. Short lengths can be quickly processed to meet your most exacting requirements . . . your most pressing emergencies.

In addition, information on prices, sizes and grades is yours for no more than a phone call.

And your Carpenter Representative brings helpful service whenever needed. From providing practical technical literature — all the way through to trouble-shooting an unusual production problem — he's a good man to know.

To get this full measure of service on specialty steels, call the Carpenter Mill-Branch Warehouse nearest you. See what a difference it makes to work with conscientious people backed by ever-increasing stocks of quality specialty steels. The Carpenter Steel Company, 139 W. Bern St., Reading, Pa.

Mountainside, New Jersey
WEstfield 2-8600

(New York City Area)
Woodside, New York
Astoria 8-0537

Newark, New Jersey
MArket 2-1703

Pittsburgh, Pennsylvania
Spalding 1-2404

Providence, Rhode Island
DExter 1-5769

Rochester, New York
Hillside 2319

St. Louis, Missouri
(currently moving
to larger quarters)

(San Francisco Bay Area)
Belmont, California
Lytell 3-8461

Syracuse, New York
Syracuse 2-0512

Tulsa, Oklahoma
CHerry 2-1341

Carpenter STEEL

Mill-Branch Warehouse Service

Mill-Branch Warehouses, Offices and Distributors in Principal U. S. Cities

inconceivable that hydrogen, randomly dispersed in solid solution, could be harmful in the proportions encountered. Almost certainly, it is segregating in some fashion.

The first reasonably consistent theory of hydrogen embrittlement postulated the following situation: A metal or alloy is naturally populated by submicroscopic rifts or voids into which dissolved hydrogen will evolve. The hydrostatic pressure developed by the hydrogen magnifies internal stresses, thus permitting crack initiation at much lower externally applied loads. The propagation of the crack depends on the ability of hydrogen diffusion to maintain the hydrostatic pressure; hence, the dependence of tensile ductility on strain rate and temperature.

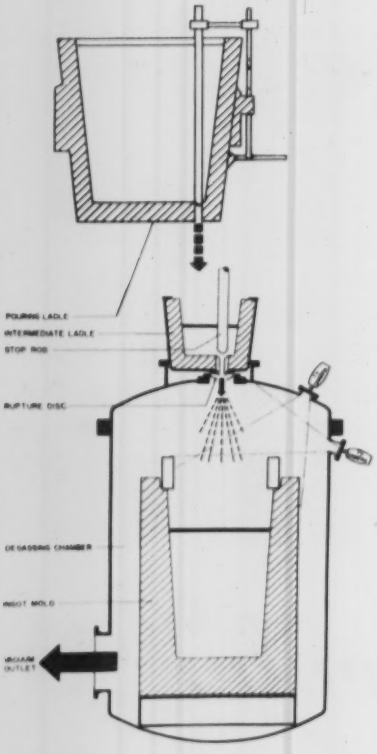
Over the last few years, there has been increasing reluctance to accept this story. First, there has never been any real evidence that voids or rifts exist. Second, the position that they should be peculiar to ferritic iron and a few other body-centered cubic metals is untenable. Why, for instance, should an austenitic steel be orders of magnitude less influenced by hydrogen?

Lattice Faults — Gaining wider acceptance is the conjecture that hydrogen must interact with groupings of dislocations which are the simple lattice faults from which plastic deformation derives. The "rifts" are likely to be high energy aggregates of dislocations. By postulating that hydrogen strongly inhibits the normal movement of dislocation assemblies, we have the mechanism of fracture initiation as well as yield point phenomena.

The problem of crack propagation need not be so dissimilar from the "rift-gas pressure" theory. Whether the maintenance of brittle crack propagation is controlled by hydrostatic pressure build up or by the equally possible reduction in the free energy of surface formation in the presence of absorbed gases cannot be distinguished at present. Both mechanisms ultimately depend on the diffusion of hydrogen in the iron lattice.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*

Toward Bigger Gas-Free Ingots



Schematic of Stokes stream degassing unit

LIKE THAT second family car, vacuum steelmaking is moving from the luxury to the necessity class. Even the idea that vacuum is for small ingots has gone out with the arrival of stream degassing techniques.

Latest in the stream degassing picture is F. J. Stokes Corp., Philadelphia. This builder of vacuum metalworking equipment recently installed a 10-ton degassing unit in a large eastern steel plant. Now it is building a 250 tonner.

Solid — This gets well into the size range of forging ingots for big steam turbine rotors and precision rolls. For these, clean steel is a must. In particular, turbine makers want steel with hydrogen content held close to 1 ppm, and vacuum practice is a practical way of achieving such a level.

Manufacturers of precision rolls are anxious for material without voids (that often show up after machining). American steelmakers are just beginning to use vacuum to achieve these results in big ingots, although European firms have been doing it for some time.

Spray—The Stokes process is a refinement of the technique in which the pouring stream is broken up into a fine shower of droplets as it passes from a ladle through vacuum into a mold. The great surface area of the droplets makes stream-degassing particularly effective. According to Stokes engineers, their process achieves a finer spray at a lower vacuum level than others now in operation.

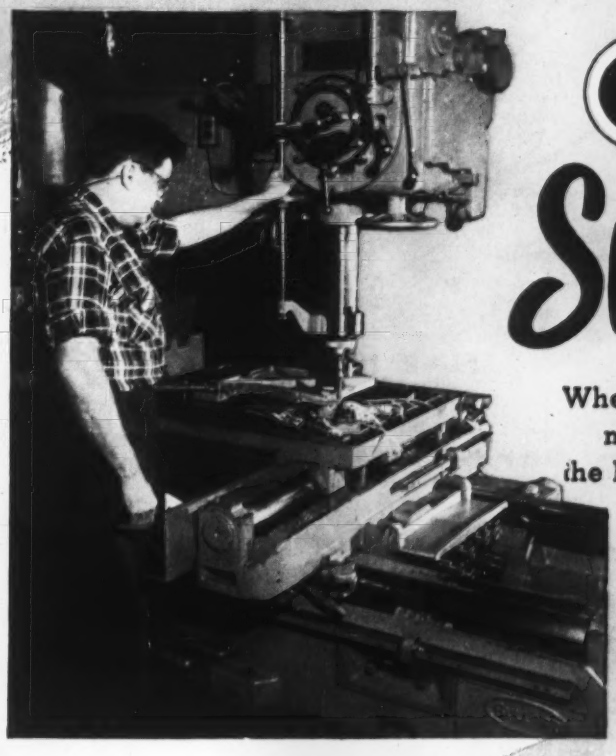
Gross features of the process can be seen in the illustration at left. The antechamber between the bottom of the intermediate "pony" ladle and the top of the vacuum chamber and the vacuum chamber itself are evacuated before pouring begins. When the stop rod in the pony ladle is lifted, the molten metal burns through an aluminum diaphragm and the instantaneous pressure drop causes the stream to diffuse into a fine spray.

Evacuation—The pumping system is a group of steam ejectors which work continuously during the pour. Vacuum is broken as soon as the pour is completed, so that the pony ladle can be transferred to another chamber if desired.

Walls of the vacuum chamber are water cooled. TV cameras at the sight glasses make it possible to monitor the pour remotely, or it can be observed directly.

ACCURATE LOCATING PERFORMANCE

Acclaimed By Customer with . . .



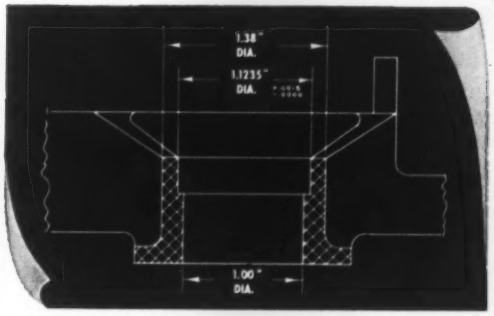
BULLARD Spacer Table

Where close tolerances must be maintained on repetitive pieces the Bullard Spacer Table is a "natural"

"The machine is simple to operate. We have found the Bullard Spacer Table very useful in our work", says a foreman at San Diego Division of Convair, "It eliminates the necessity of zeroing to a set position. And there is no chance for error, which is important when you make accurate parts for airplanes."

This same accuracy to close tolerances can be applied to your drilling, reaming or tapping operations without the high cost of jigs or fixtures.

Identical machining operations on each of three holes for battery carriage are performed on the Bullard Spacer Table.



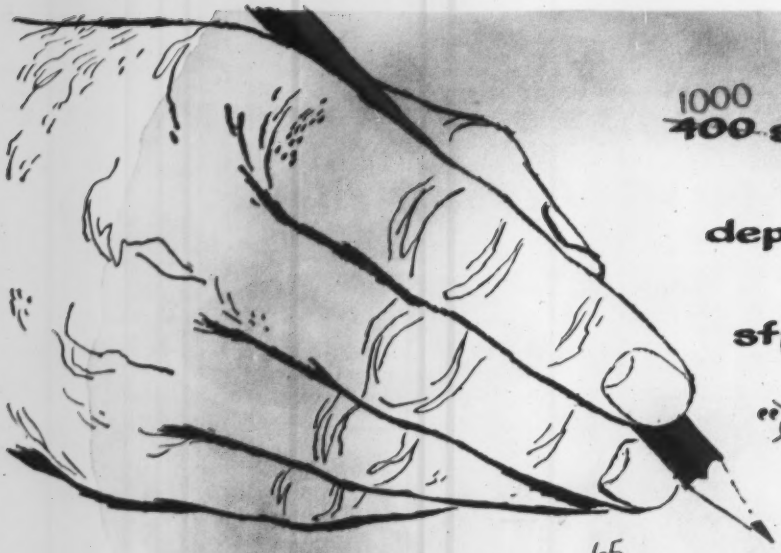
OPERATION DATA

OPERATION	SET-UP TIME	UNIT TIME
Drill 1" dia.	.70	.2066
Counterbore 1.1235" dia. at 1.000 dia. .350" deep	.25	.0566
Face 1.38" dia.	.25	.0356

CALL YOUR NEAREST BULLARD REPRESENTATIVE OR WRITE FOR SPACER TABLE CATALOG TO

THE **BULLARD** COMPANY

BRIDGEPORT 2, CONNECTICUT



1000
~~400~~ sfpm

depth of cut-.125 ~~.005~~

1250
sfpm-~~800~~

~~"unmachinable"~~

2000
~~250~~ sfpm

65
pieces per hr.-~~20~~

1175
SAE 1035-~~250~~ sfpm

505
HS-Steel-~~90~~ sfpm

4
min. per cut-~~40~~

you can scrap your ideas of cutting-tool performance . . .

STUPALOX

introduces a NEW ERA!

The figures above show the amazing improvements in production obtained through the use of STUPALOX sintered oxide cutting tools in place of tools previously used. Actually the figures are conservative, because tool performance in many cases was limited by inadequate power and rigidity of the machine tool.

Stupalox Tools are available now in commercial quantities, and a variety of styles and sizes of inserts. Write for complete data.

HANDY PACKAGE — *contains ten inserts*

This compact plastic box provides a practical container for ten Stupalox sintered oxide inserts.

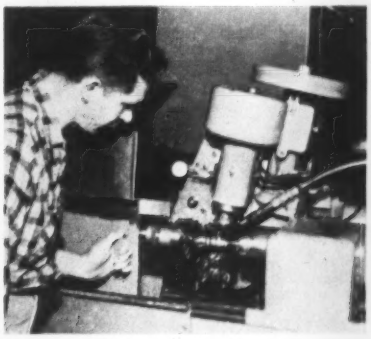
STUPAKOFF DIVISION OF
The CARBORUNDUM Company
WRITE DEPT. S LATROBE, PENNSYLVANIA

Triples Output

A MODIFIED hobber machines the sector gears for Chrysler's full-time power steering equipment at three times the former rate.

Shock—Because the part is a sector (not a full gear) the hobber has to be rigid enough to withstand the shock of a hob that runs free for a portion of each revolution. The machine combines high production, minimum noise and pounding, good tool life and accuracy. A shaving operation follows.

The machine is a modified model 1458 Michigan hobber. A hydraulic cylinder mounted on the main head feeds the hob across the work. In addition, the hob is fed at an angle to the axis of the part to produce a tapered tooth.



MODIFIED HOBBER

. . . machines automobile power steering part

Accuracy—Quality work depends on proper positioning of the forged parts. There is no previous machining on the sides of the sector blank. To overcome the effects of variations, the machine uses a collet type aligning and holding fixture. The operator merely places the part and pushes a button to move the tailstock into position.

Hydraulic pressure holds the tailstock and the collet securely to prevent misalignment during hobbing. The equipment produces 45 sectors an hour. Hobs are sharpened after producing 110 parts.

Superston 40: Minimum Test Bar Results

	Static Sand Casting	Centrifugal Casting	Hot Reduced & Cold Worked Wrought Alloy
Tensile strength, psi	92,000	95,000	100,000
Yield strength at 0.5 per cent elongation, psi	42,000	45,000	50,000
Elongation, per cent in 2 in.	20	22	15
Reduction of area, per cent	20	25	15
Brinell hardness (10-mm ball, 3000-kg load)	160	165	180

New Bronze with 12 Per Cent Mn

SUPERIOR mechanical properties and castability are combined in a new aluminum bronze alloy that contains almost 12 per cent manganese. Called Superston 40, it was developed for marine propellers by the British firm of J. Stone & Co. (Holdings) Ltd., London. American Brake Shoe Co., New York, and Ampco Metal Inc., Milwaukee, have formed Superston Corp. to market the alloy in the U.S.

Typical aluminum bronzes contain 81 to 89 per cent copper, 9 to 11 per cent aluminum, no manganese. This makes Superston 40, with its nominal composition of Cu 75, Mn 12, Al 8, Fe 3, Ni 2, a most unusual addition to this group of alloys.

Strong—The whitish-gold alloy surpasses other commercial bronze alloys in yield strength, toughness (Izod notched impact strength is 18 to 30 ft-lb) and fatigue life. If also melts at a lower temperature (1814 F), casts better and can be readily forged, rolled or extruded, claims American Brake Shoe.

Improved castability gives it an advantage over conventional aluminum bronzes, which foundrymen generally consider difficult to cast. Thin vanes, for example, flow readily. Even for heavy sections, the feeding and solidification characteristics assure soundness in the finished casting. It can be centrifugally cast with superior results. (One such product: A tube which is 12 ft long, has an OD of 20 in., walls 3 in. thick.)

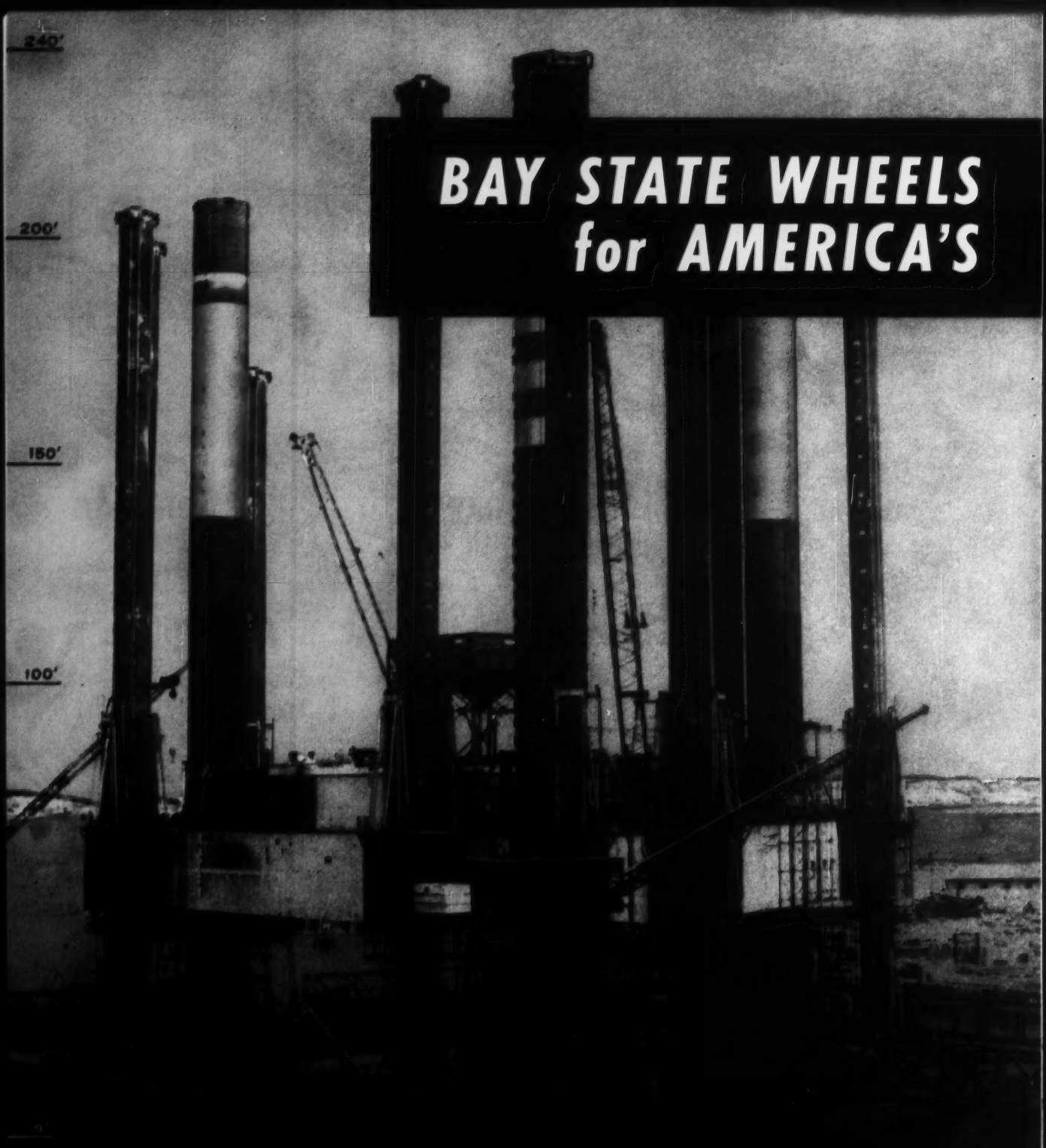
Wrought Products — Superston 40 is a good hot working alloy. Cold working, unless followed by interstage annealing, is limited to such operations as cold drawing for sizing after extrusion.

The alloy can be used in the manufacture of wrought products as thin as 0.017 in. In Great Britain, it has been rolled into condenser tube plates. It has been used to make nuts and bolts. It can be made into welding rod for joining or overlay.

On Trial—Steel mill slippers cast with Superston 40 are undergoing mill trial in this country. While not of intricate design, the slippers require high yield strength and good elongation. Other parts slated for comparative testing in steel mills: Gears, connecting rods, slides, gibs and nuts.

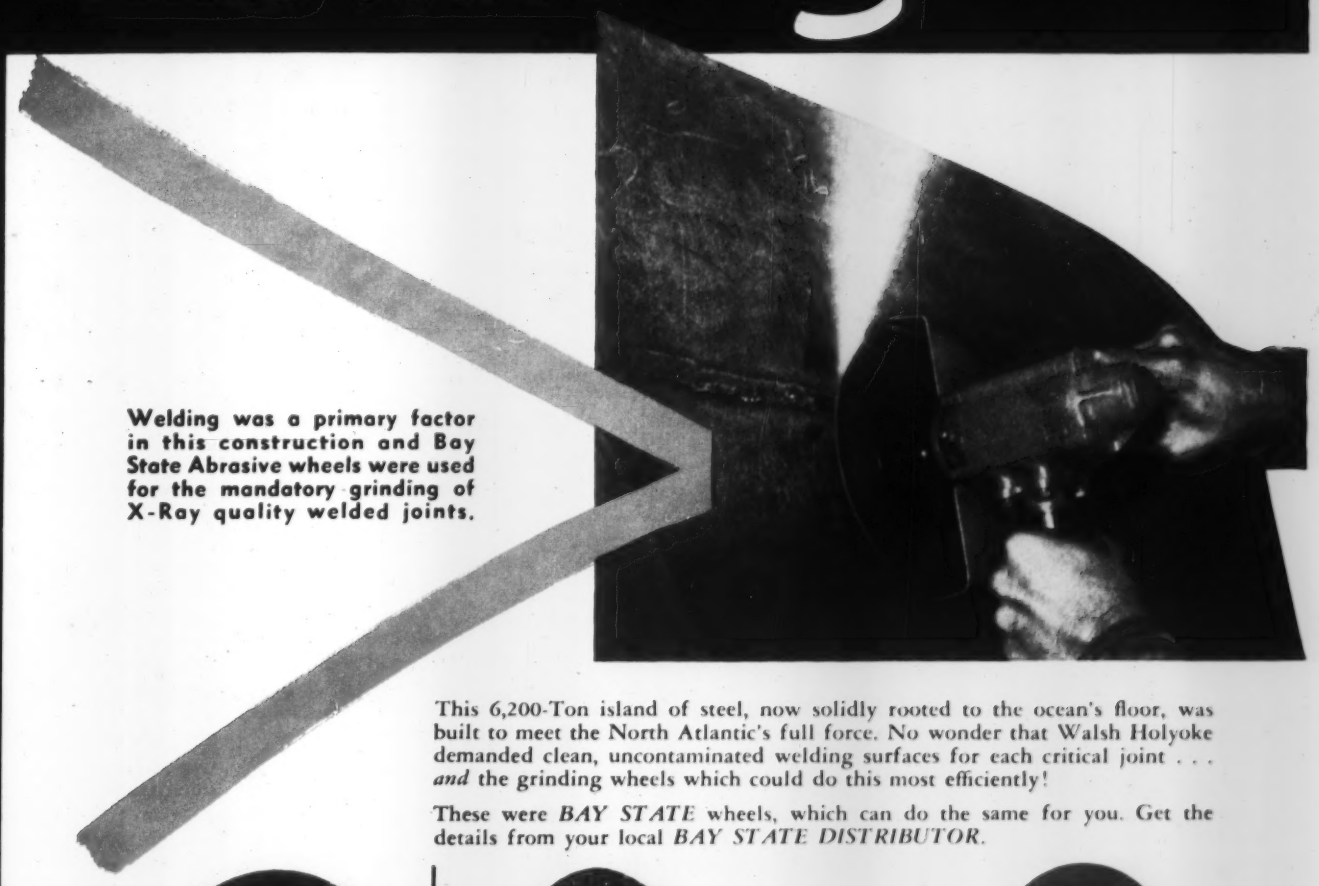
In British installations, condensers and pumps of the new alloy have been employed to handle sea water, proving its effectiveness in combating saline corrosion. The new alloy should find widespread foundry use in sand, centrifugal, shell or permanent mold casting.

Superston 40 will sell in the U.S. at prices comparable to high-quality aluminum bronze.



Texas Tower #3 shown during fabrication, courtesy of Continental Copper & Steel Industries, Inc., Walsh Holyoke, Portland Maine Division, builders. Sustaining hollow columns 240 feet high and 14 feet in diameter are of all-weld construction.

GRIND X-RAY QUALITY WELDS TEXAS TOWER #3



Welding was a primary factor in this construction and Bay State Abrasive wheels were used for the mandatory grinding of X-Ray quality welded joints.

This 6,200-Ton island of steel, now solidly rooted to the ocean's floor, was built to meet the North Atlantic's full force. No wonder that Walsh Holyoke demanded clean, uncontaminated welding surfaces for each critical joint . . . *and* the grinding wheels which could do this most efficiently!

These were *BAY STATE* wheels, which can do the same for you. Get the details from your local *BAY STATE DISTRIBUTOR.*

BLUE FLASH

Specification A-24R-BF2 used for grinding straight welds, corners, angles, and deep joints.

FLARING CUPS

Specification 3A-16Q4-BA2 used for heavy snagging of wide welds, and surface preparation on broad areas.

BAY STATE®
WHEELS of PROGRESS

BAY STATE ABRASIVE PRODUCTS CO., Westboro, Massachusetts, U. S. A.

Branch Offices and Warehouses: Bristol, Conn., Chicago, Ill., Cleveland, Ohio, Detroit, Mich., Pittsburgh, Pa.
Distributors — All principal cities
In Canada: Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ont.

This inspector is using a low-pressure type King Tester to check Brinell hardness. Speed and accuracy cut costs, reduce rejects

Accurate Hardness Tester

THE man in the photograph is demonstrating one way to get accurate hardness readings on heavy, odd-shaped metal parts.

The instrument he's using is a portable Brinell tester made by the King Tester Corp., Philadelphia. The part is an aluminum casting used by the I-T-E Circuit Breaker Co., Philadelphia.

Costly—With heavy stationary equipment, such parts can be unreasonably expensive to test. Samples can be cut, but they require records and take time to process. Without elaborate fixturing, parts may drag, leaving an inaccurate oval impression.

The tester with its alloy steel base weighs less than 30 lb. The test head is easily removed by loosening two screws. For other applications, it can be mounted in chain slings, on a drill press head, in an arbor press or similar solid machinery. Many adapters will fit hard-to-reach spots, narrow, cramped spaces, around corners and flanges. Some can even be mounted inside holes.

Construction — Instead of fixed weights, this tester uses a hydraulic cylinder and a relief valve. It opens when the load on a 10-mm ball reaches 3000 kilograms, providing automatic relief.

Applying the load two or three times is the equivalent of holding a dead load for more than 15 seconds. The maker says results are accurate within the 1 per cent limits prescribed by ASTM specifications.

Limitations Overcome—Originally, the Brinell test was limited to hardnesses under 495. A carbide ball now tests materials that approach the diamond in hardness. In addition, carbide leaves a much clearer, more accurate impression in cast metals, which tend to break around the edges of the impression making it hard to measure.

If you don't want to deform the surface of a specimen, you can use a 5-mm ball and vary the load (it can be as low as 62½-kilogram). Even soft metals (like the one in the photograph) can be accurately tested.

Marking Machine

Replaces manual method General Electric used to mark rigid conduit

AN automatic marking machine identifies all the rigid conduit made at General Electric Co.'s plant at New Kensington, Pa.

It does the job faster than the old hand method, and markings are permanent, more durable.

No Glue—Local laws and building codes require that all conduit be imprinted with the manufacturer's name and trademark, the Underwriters' Laboratories issue number and data.

That information used to be printed on a decal, which was applied manually. Decals were sticky and easily damaged. Handling and shipping often tore them off. Hand application slowed production—a knotty problem since such work was usually done by inexperienced help.

Help—To automate the job, GE officials called on the Markem Machine Co., Keene, N. H. Two machines were installed late in 1955. Each one handles conduit 10 ft long in diameters of ½ to 2 in.

Stamping takes place between final inspection and the shipping bay. En route, the conduit passes over a limit switch which operates the automatic imprinter. Permanent ink is used for maximum durability.

"Changes are minor when transferring from one pipe size to another," say GE officials. Operators can easily switch inks when transferring from white to black conduit. GE stamps black conduit with blue inks, white conduit with red.

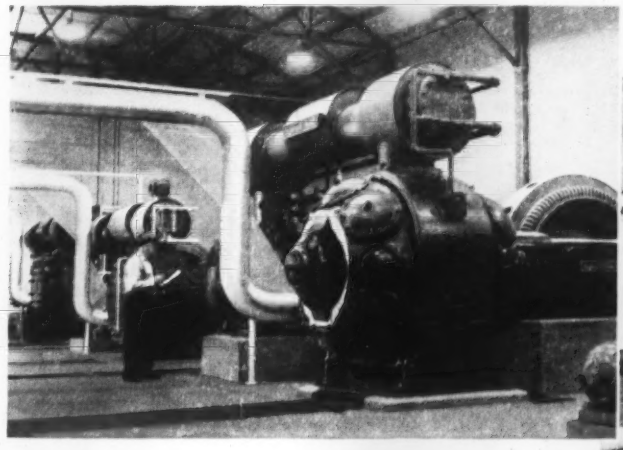
"We are satisfied with the speed of automatic marking," plant operators add. "Maintenance of equipment is minor, and the markings are distinct."

The machines will handle up to 30 conduits per minute. They are driven by a fractional horsepower electric motor. The printing head is mounted on a pedestal.

Some Markem machines will handle pipe as large as 4 in. in diameter. The firm also supplies rubber roller dies, including the UL device under the standard licensing arrangement.

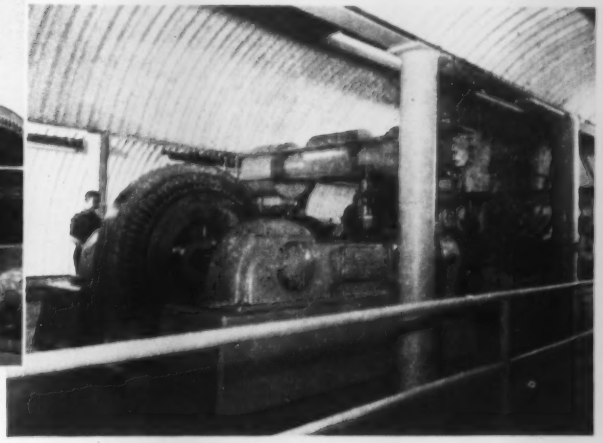
11,000 ft UP
or 4,000 ft DOWN

Ingersoll-Rand PRE Compressors keep rock drills working at top efficiency



Installed at an elevation of 11,500 feet above sea level, three 800-horsepower and two 600-horsepower Ingersoll-Rand PRE compressors, two of which are shown here, supply 100-psi air for Ingersoll-Rand rock drills at Climax Molybdenum Company's two-level development mining at Climax, Colorado. The modern compressor building is located on the surface, directly above the mine workings, which contributes to maximum efficiency for air distribution.

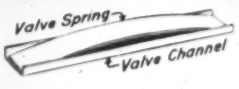
This dependable supply of air power helps keep pressure up to 90 to 100-psi at the cutting faces, thus assuring optimum results for the drilling operations which enable Climax to produce approximately 30,000 tons of ore per day.



Way down underground on the 1200 level, this 400-horsepower Ingersoll-Rand PRE compressor and two smaller units provide 100-psi drilling air for zinc and lead mining operations in Bunker Hill's Star Mine in the Coeur d'Alene district in Idaho.

Located 1200 feet below the shaft collar, these units feed into the same air line as another PRE unit on the *4,000 level*. With dependable I-R compressors at both ends of the system, line losses are reduced and full pressure is maintained at the drills.

Only I-R Compressors have CHANNEL VALVES



- High Efficiency
- Quiet Operation
- Remarkable Durability
- Air-Cushioned Action
- Corrosion-Resistant
- Channels are rigid
- Entirely different

Ingersoll-Rand PRE Compressors, of the horizontal, double-acting crosshead type, are heavy-duty machines built for continuous full-load service. Their extra stamina and low maintenance are big assets in mining service. The completely sealed frame keeps out dust and dirt. Running gear requires no internal adjustments.

Pipeless force-feed lubrication cuts operating and maintenance costs. These and many other features make the PRE an ideal compressor for use wherever large volumes of air are to be handled and pressures must be maintained within close limits over the complete capacity range. Ask your I-R representative for complete information.

Ingersoll-Rand IR

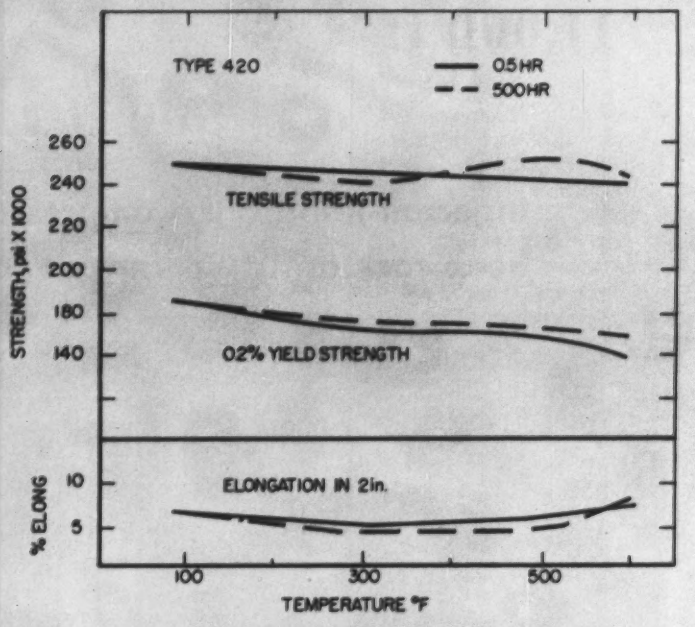
1-431

11 Broadway, New York 4, N. Y.

COMPRESSORS • GAS AND DIESEL ENGINES • ROCK DRILLS • PUMPS • TURBO-BLOWERS • AIR AND ELECTRIC TOOLS

Designers must consider both normal and low temperature properties of stainless in tomorrow's aircraft. Here are data on the martensitic types

By EDWARD A. LORIA
Staff Metallurgist
Crucible Steel Co. of America
Pittsburgh



After a short or long exposure to elevated temperatures, this is what happens to the tensile properties of 420 sheet

Stainless in Aircraft Design

PROBLEMS associated with aerodynamic heating call for new data to help the builder of tomorrow's aircraft.

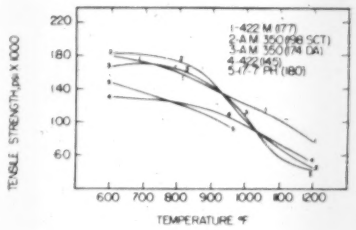
Comparisons of structural efficiency are based on mechanical properties at room and elevated temperatures. Among the martensitic stainless steels, some in the 400 series deserve consideration because they can be heat treated to high strength levels. They retain these properties upon exposure to high temperatures. Grades 17-7 PH and AM-350 also are in this hardenable category. Both depend a great deal on a tempered martensite structure for their maximum properties.

Strengths — Crucible 420 is a straight chromium steel. Its ultimate strength is 240,000 to 260,000 psi. In this range, it has a higher strength-weight ratio than any currently used stainless sheet. (For maximum hardness, heat to 1825°F, follow with air cooling and tempering at 600°F.) Crucible 422 and 422M contain less carbon, but have molybdenum, tungsten and vanadium as alloying elements for high temperature strength when the steels are tempered at 900 to 1200°F.

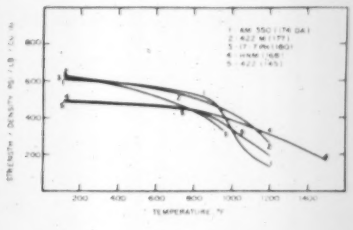
AM-350 hardens to high strength levels yet retains its ductility. Hardening of solution annealed (1725°F) steel is done by subzero cooling, followed by tempering at 750°F. This produces optimum room temperature properties (195,000 psi tensile and 12 per cent elongation). The established heat treatment for 17-7 PH is a two-step transformation treatment of 1900°F solution annealed steel. Final tempering at 1050°F produces typical values of 200,000 psi tensile and 9 per cent elongation in sheet.

The properties for 422 and 422M are based on tempering at 1200°F. These steels can be put in service at any lower temperature yet will resist softening. Lowering the drawing temperature would raise the room temperature properties and the tensile and rupture values at the lower end of the scale. But there is no advantage in using these steels in this way when the leaner alloy (lower cost 420) does the job adequately.

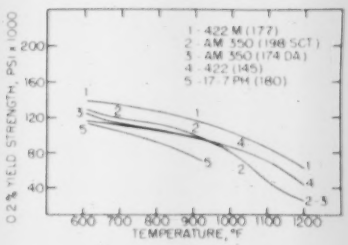
Sheet — The ultimate tensile strength of 420 sheet does not drop significantly at temperatures



Tensile strengths of five martensitic steels at various temperatures. Room temperature tensile strengths are given in parentheses



Comparison of the strength-density ratio of five martensitic steels. Room temperature strength (x 1000 psi) shown in parentheses



Yield strength of martensitic steels at exposure temperature. Room temperature strengths (x 1000 psi) shown in parentheses

up to 600°F even after 500 hours. Tensile yield strength drops from 200,000 psi at room temperature to 160,000 psi at 600°F. The compressive yield strength only decreases from 210,000 psi to around 200,000 psi in the same range. Exposure to temperatures as high as 600°F for periods up to 500 hours has little effect on room temperature properties, indicating that the structure obtained from the prescribed heat treating cycle is stable.

In the 600 to 900°F range, the tensile strengths of 422M and AM-350 are higher than those obtained for the austenitic HNM and A-286. The 422M retains surprisingly high strength between 900 and 1200°F.

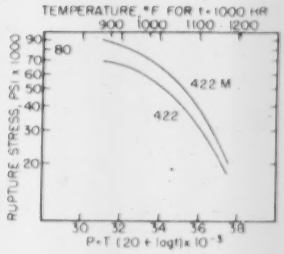
Elevated temperature tensile tests on subzero cooled and tempered AM-350 show only a slight drop in properties up to 900°F. Stress rupture tests indicate that the steel has structural stability for 1000 hours at 800°F (160,000 psi) and 900°F (97,000 psi). Owing to continued precipitation of alloy constituent and consequent embrittlement of 17-7 PH at temperatures above 600°F, this service temperature reaches its maximum for 17-7 PH tempered at 1050°F. Up to 600°F, tensile strength does not drop appreciably. The 1000-hour rupture strength of 157,000 psi at 600°F indicates a stable product.

Design Criterion—Any appreciable amount of permanent deformation is undesirable in aircraft structures. A comparison of the tensile yield strengths is necessary. The far superior yield strength of 422M over the entire temperature range is noteworthy.

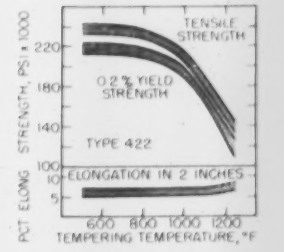
The values for 422 are almost equal to those for AM-350. The yield strengths could be brought to the same level as 422M simply by tempering the steel to the same strength level as the other steels (175,000 to 180,000 psi).

The 1000-hour rupture strength becomes the design criterion above 950°F. The short time yield strength must meet this level of properties as well. Expect a somewhat lower creep strength.

Tempered at 1200°F, the additional tungsten, molybdenum and vanadium in 422M increase stress rupture over the 900 to 1200°F range. The 1000-hour rupture strengths at 1000°F are 48,000 psi and 59,500 psi for 422 and 422M, compared with 52,000 psi for AM-350. The 1000-hour rupture strengths at 900°F are 68,000 psi and 89,000 psi for 422 and 422M, compared with 92,000 psi for AM-350 and 57,000 psi for 17-7 PH. For



Master rupture curves for 422 and 422M. Additional W, Mo and V increase the stress rupture of 422M



How variations in tempering temperatures vary the tensile properties of 422 sheet

Chemical Composition

Grade	C	Cr	Ni	Mn	Si	Mo	W	V	Al
420	0.37	13.4	0.15	0.38	0.40				
422	0.22	11.7	0.70	0.65	0.36	0.95	0.93	0.25	
422M	0.28	11.8	0.20	0.84	0.24	2.24	1.72	0.50	
AM-350	0.08	17.0	4.20	0.60	0.40	2.75			
17-7 PH	0.07	17.0	7.00						1.15

Code	Gage (in.)	Tensile (psi)	Elongation (per cent)	Tensile (psi)	Elongation (per cent)
		Tempered 900°F for 2 minutes		Tempered 900°F for 5 minutes	
A	0.025	222,000	8.5	215,000	8.0
	0.125	210,000	9.5	206,500	8.5
B	0.025	212,000	8.5	202,000	9.5
	0.125	204,000	10.0	203,700	11.5
C	0.025	248,500	7.0	254,000	8.0
	0.125	243,000	8.0	240,000	9.5
D	0.025	246,800	9.5	242,000	8.5
	0.125	241,000	9.0	237,200	10.5

These are the tensile properties of type 422 sheet 36 in. wide. They were heat treated in the mill laboratory furnace to simulate the conditions in the continuous hot strip rolling mill. Codes A and B were austenitized at 1800°F for 4 minutes. Hardness, as tempered, 44-48 and 43-46 (Rockwell C). Codes C and D were austenitized at 1900°F for 4 minutes. Hardness, as tempered, 49-51 and 48-50 (Rockwell C). Properties, as-annealed: 95,000-103,250 psi tensile, 62,000-75,900 psi yield and 20-24 per cent elongation.

heat treated steels, the upper limit of the stable range is usually related to the heat treating temperature. Top temperature for 1000-hour stability is near 950°F for 422 and 800°F for 17-7 PH.

Sheets of 0.062-in. thick 422 furnace cooled from a 2100°F brazing treatment produce a hardness of Rockwell C 54-58. It is excellent for high temperature furnace brazing. It is easily wetted by nicrobraze, so that it makes high strength joints in narrow spaces (0.0005 to 0.002 in.). The tensile strength of these brazed joints is 127,000 to 135,000 psi at room temperature, and 89,000 to 104,300 psi at 1000°F. The joint efficiency ratios (which indicate how close the strength of the brazed joint approaches the strength of the base metal) were 80 per cent at room temperature and 88 per cent at 1000°F.

Design Tool—Charts that show mechanical properties vs. tempering temperatures are a necessary tool for the designer. One is shown on page 153. The range of values was obtained in 0.025 and 0.030 in. thick 422, taken from both the longitudinal and transverse directions in 48-in. wide coils. Test specimens were heated at 1800°F for 15 minutes, air cooled and tempered for 2 hours at each temperature. Higher properties might be possible since similar work on 420 shows that the best tensile results and surface are obtained in a controlled atmosphere furnace (endothermic, with +25°F dew point).

Short heat treatments in an air furnace produce both high strength and ductility (9 to 10 per cent elongation) in 422 sheet.

The annealed properties of 420 average 85,000 psi tensile, 48,000 psi, 0.2 per cent yield and 24 per cent elongation. Good formability in 48-in. wide coils has been obtained. Minimum bend radii in 0.030 and 0.50-in. gages are 1/32 and 1/16-in., while stretch forming without localized deformation amounts to 14 and 12 per cent in the 18 gage.

Annealed 420 offers only slightly more resistance to shearing than 302 annealed. Spotwelding is an excellent method for assembling 420 steel parts. The corrosion resistance of 420 is not as good as that of the austenitic grades, but its high strength more than offsets the disadvantage. Corrosion resistance can be increased markedly by ultrasonic, electro or mechanical polishing.

An extra copy of this article, and Part I (on austenitic grades) which appeared last week, is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.

Austenitic HNM at room temperature is often compared with martensitic and semiaustenitic types. This table shows that yield strengths over 150,000 psi are possible in cold worked sheet or stretch formed parts hardened by short time, low temperature aging. Annealed values show that HNM can be severely formed like Type 302. Over 900°F, tensile and creep are better than those of 17-7 PH and AM-350

Sheet No.	Tensile (psi)	0.2% Yield (psi)	Elongation (per cent)	Hardness
	Annealed 2050°F for 10 minutes. Air Cooled (0.050 in.)			
1	101,800	56,200	49.0	85 Rb
2	101,200	59,700	48.0	87
3	110,800	61,700	48.0	90
4	110,500	52,400	47.0	90
	Cold Rolled Condition. Reduced 30% (0.037 in.)			
1	151,300	138,500	13.0	35 Rc
2	147,400	138,200	14.5	34
3	148,200	138,500	14.0	35
	Cold Rolled (0.037 in.) Aged 1200°F for 2 hr			
1	168,400	145,000	15.0	39 Rc
2	168,000	150,000	14.5	40
3	172,600	145,400	13.0	40
	Cold Rolled (0.037 in.) Aged 1200°F for 4 hr			
1	170,000	150,600	14.0	41 Rc
2	173,800	154,400	11.5	41

You get what you want with

DANLY

PRESSES

PLANT PLANNERS

Get Better Production Balance, Easier Automation, Faster Installation

New Danly presses stand up to full capacity operation, single shift or around-the-clock, with minimum down-time . . . you get the performance you plan on. No more "production pile-up" with presses producing at less than full capacity or shut down entirely. Controls are "built-in" for convenient floor level adjustment, ideal for automation, designed for maximum safety.

Each press is delivered pre-tested and ready to go . . . saving weeks of costly erection time.

Phone or write for complete catalog information. Get the whole story and see for yourself.

DANLY MACHINE SPECIALTIES, INC.
2100 S. Laramie Ave., Chicago 50, Ill.

DANLY®

It's What She Thinks that Counts!

Again

THE HOUSE OF STAINLESS

Demonstrates

How Stainless Steel

Can Do The Job Better

to Keep Homemakers Happy

THE NEED—

In today's competitive market, manufacturers must seek out materials that will give their products the highest quality for the performance users expect. In line with this thinking, Eureka engineers were not satisfied with the die-cast material used for the sole plate on the carpet nozzle of their canister cleaner. The softness of the material caused scratches in the plate, resulting in excessive friction so that the unit did not measure up to the smooth-performance standards set by Eureka.

THE ANSWER—

Exploring the possibilities of stainless steel, they consulted CSS metallurgists who recommended a type of stainless that corrected this problem—thanks to its toughness and resistance to abrasion and scratches. In addition, it gave them such bonus benefits as longer service life, greater strength-to-weight ratio, added prestige of stainless in the product, and ready availability of material.

With any product, it's customer-satisfaction that counts. That's why the original cost of stainless steel may not always give an accurate picture of its possibilities for your product. Metallurgists at The House of Stainless will be glad to help you examine the over-all picture of stainless in your production. Then we'll back up their recommendations with deliveries from warehouse stocks or mill shipments through our mill placement department.

The House of Stainless

Just phone LAfayette 3-7210

CHICAGO STEEL SERVICE COMPANY

Kildare Avenue at 45th Street, Chicago 32, Illinois. Mailing Address: P.O. Box 6308, Chicago 80, Illinois.

Milwaukee District Office: 757 N. Broadway, Milwaukee 2, Wis., Telephone BRoadway 3-7874.

Sales Representatives at Bloomington and Rockford, Illinois; Indianapolis and South Bend, Indiana; Cedar Rapids and Davenport, Iowa; Grand Rapids, Michigan; Minneapolis, Minnesota; Appleton, Wisconsin.

Forging Press Has Electromagnetic Controls

Instant response to the operator's finger tip control is featured by this hydraulic press.

By arranging the press for semiautomatic operation, the forging cycle can be preset to incorporate any desired advance, press, release, return speed and tonnage.

The press can be operated manually. This control is easily detached from the panel by the operator and can be used from any nearby position.

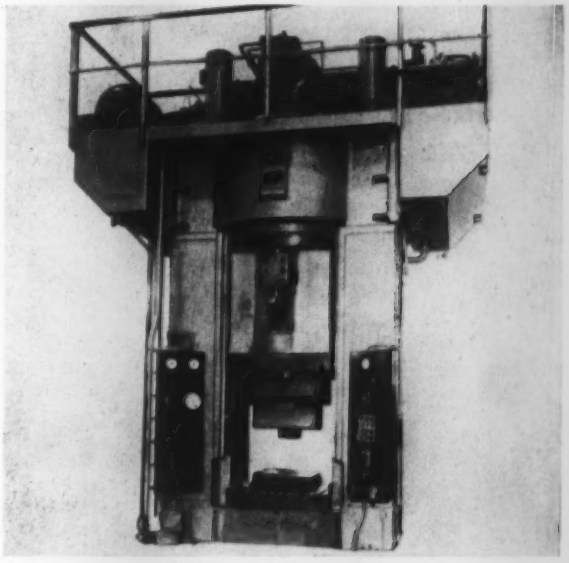
Remote control is especially valuable when checking die alignments from all four sides of the press.

Hydraulic knockouts can be set to eject the forging from the die at any position in the cycle.

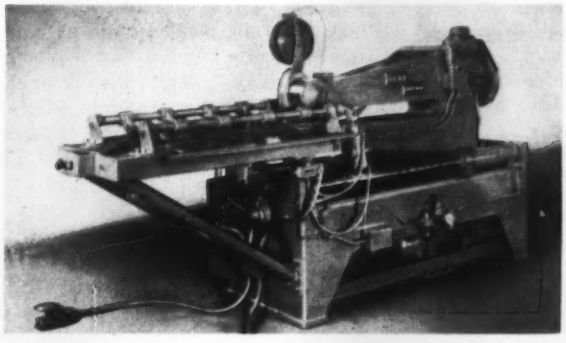
The guide system can be adjusted in 1 hour to insure accurate alignment of the die. No shimming is needed.

This 1500-ton machine is designed for no-draft nonferrous forgings.

Other sizes and modifications combine to meet any forging need. *Write*: Erie Foundry Co., Erie, Pa. *Phone*: 2-6754



Automatic Stitcher Joins Coil Ends Quickly



This 36-in. stitcher automatically joins the leading end of a new coil to the trailing end of the preceding one in 15 to 20 seconds.

The operator aligns the two ends in the machine (with a 3 to 5 in. overlap) and clamps them tight. They are joined with 14 locked stitches set in parallel rows 2 in. part. The joint passes over rolls easily and will withstand elevated temperatures.

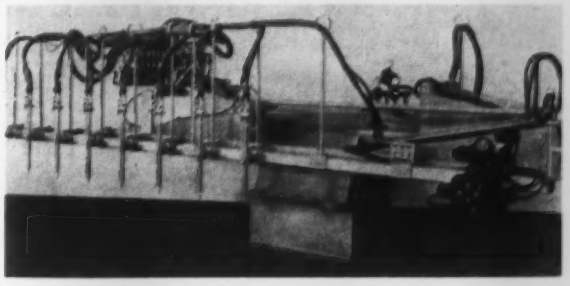
Maximum thicknesses that can be handled: Two pieces of 0.050 in. cold-rolled steel, two pieces of 0.093 in. aluminum and two pieces of 0.035 in. copper. *Write*: Herr Equipment Corp., 1200 Vine St. N.E., Warren, O. *Phone*: 5958-1

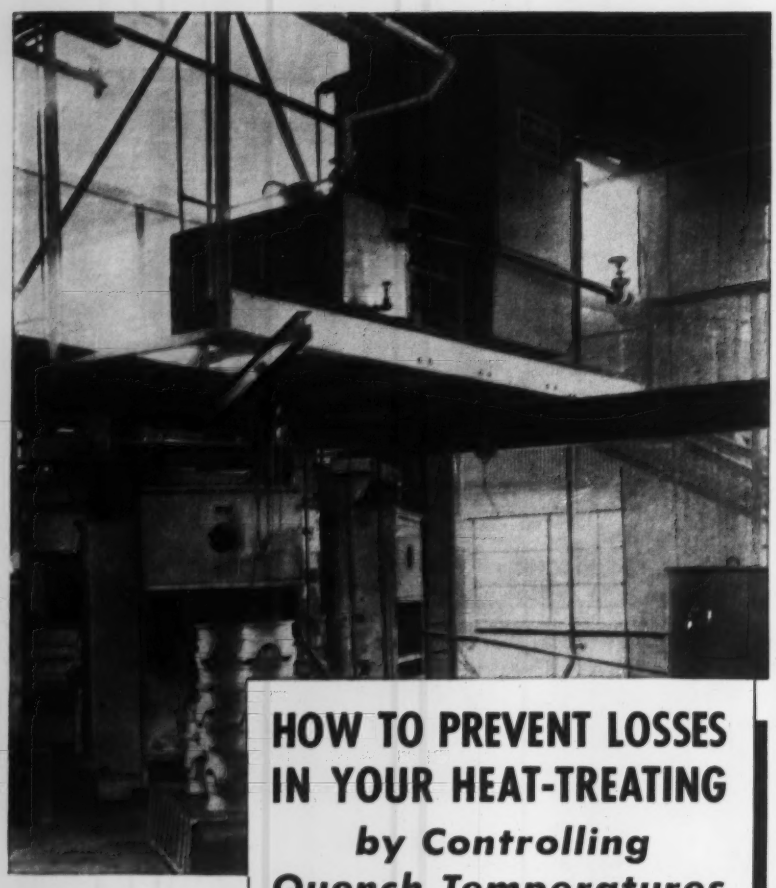
Oxyacetylene Shape Cutter Carries Automatic Equipment

The No. 56 Oxygraph is designed to carry motorized cutting torch holders, a solenoid gas distribution system and the electronic tracer. All are controlled from an operator's station.

The stationary machine has a fixed cutting area (a circle 56 in. in diameter), but it can be converted easily to cover larger area and unlimited length by the addition of rails and a traveling carriage.

Electronic, manual and magnetic tracers may be used. *Write*: Air Reduction Sales Co., division of Air Reduction Co. Inc., 150 E. 42nd St., New York 17, N.Y. *Phone*: Murray Hill 2-6700





HOW TO PREVENT LOSSES IN YOUR HEAT-TREATING
by Controlling Quench Temperatures

● Using Niagara's AERO HEAT EXCHANGER to cool your quench bath never fails to give you real control of the temperatures at which you wish to quench.

Your experience will be the same as others who have installed this method. You'll get better physicals; save losses and rejections; increase heat-treating capacity and production with lower costs. You can put back heat into the quench bath to prevent the losses of a "warm-up" period. You remove heat at the rate of input and prevent flash fires in oil quench baths.

You'll save space in your heat treating department and get a more productive arrangement because less room is needed for coolers and tanks. You'll find savings in piping, pumping and in the amounts of oil you will have to buy. And the saving in the cost of cooling water alone is enough to repay the cost of the Niagara Aero Heat Exchanger, usually in less than two years.

Write for Bulletin 120 and further information

NIAGARA BLOWER COMPANY

Dept. S, 405 Lexington Ave. New York 17, N. Y.

Niagara District Engineers in Principal Cities of U. S. and Canada

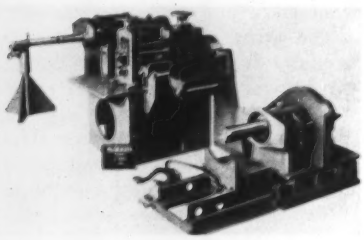
INDUSTRIAL COOLING HEATING • DRYING
NIAGARA
HUMIDIFYING • AIR ENGINEERING EQUIPMENT

NEW PRODUCTS and equipment

Slitter Lines

Ferrous and nonferrous metals in gages up to ¼-in. are processed by these slitters.

They produce close-tolerance widths by controlling the material at the cutting point with stripping rings and other improved features.



A pay-off device limits the amount of waste edge-cut; selvage is kept to minimum. *Write*: H. J. Ruesch Machine Co., 407 Mulberry St., Newark 2, N. J. *Phone*: Market 3-0759

Rosin Core Solder

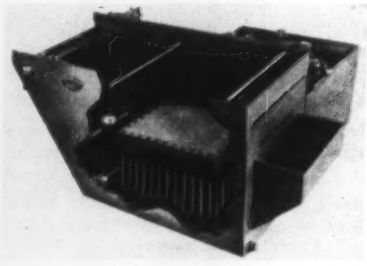
RTS solder has good noncorrosive characteristics. Its odor is minimal. And its activating chemicals are not toxic to the skin or the respiratory tract.

The solder quickly pierces oxide film and corrosion products. *Write*: Federated Metals Division, American Smelting & Refining Co., 120 Broadway, New York 5, N. Y. *Phone*: Rector 2-9740

Screen Filter

The Delpark Filter-Matic efficiently handles large volumes of coolants, cutting oils and all liquids requiring removal of minute particles.

Small diameter screen tubes are manifolded together into a com-



RESEARCH
IS ALWAYS ON

- in fatigue life
- materials • new uses
- production methods

TO GIVE YOU THE
BEST IN SPRINGS
FIRST

WALLACE BARNES COMPANY, BRISTOL, CONNECTICUT
THE WILLIAM D. GIBSON COMPANY, 1600 CLYBOURN AVE., CHICAGO 14, ILL.
RAYMOND Manufacturing COMPANY, CORRY, PENNSYLVANIA
BARNES-GIBSON-RAYMOND, 40300 PLYMOUTH RD., PLYMOUTH, MICH.
B-G-R COOK PLANT, ANN ARBOR MICHIGAN
SEABOARD Coil Spring Div., 15001 S. BROADWAY, GARDENA, CALIF.
OHIO DIVISION, 1825 EAST FIRST ST., DAYTON, OHIO
WALLACE BARNES COMPANY, STATE FAIR BLVD., SYRACUSE 9 (Eastern), N.Y.
MILWAUKEE DIVISION, 341 E. ERIE ST., MILWAUKEE, WIS.
DUNBAR BROTHERS COMPANY, BRISTOL, CONN.
F. N. MANROSS AND SONS CO., BRISTOL, CONNECTICUT
THE WALLACE BARNES CO., LTD., HAMILTON, CANADA

DIVISIONS OF ASSOCIATED SPRING CORPORATION
COAST TO COAST

Divisions of
ASSOCIATED SPRING CORPORATION

US Sand Blast Hose

Dissipates Static Electricity as no other hose can!

Blasting with either sand or steel shot can build up a static electrical discharge so potent that the operator cannot handle the hose. In extreme cases the hose wall may even be perforated by this man-made form of lightning. An exclusive construction makes U. S. Sand Blast Hose *conductive*—and (more thoroughly than any other hose) prevents static build-up.

The strong carcass is built to handle any required pressures—is rigid enough to hold its shape, yet is always flexible for easy handling. High-grade rubber cover resists abrasion. Tube has the high abrasion resistance so essential in steel and shot blasting.

Obtainable at any of the 28 strategically located "U. S." District Sales Offices, or write Mechanical Goods Division, United States Rubber, Rockefeller Center, New York 20, New York.

US RUBBER

Mechanical Goods Division

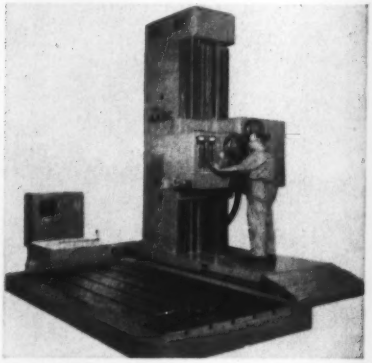
United States Rubber

mon suction header through which sludge laden liquid is drawn. As screen deposits reduce the liquid flow, a multiple chamber valve is reversed and accumulated deposits are backwashed from the screens.

Sludge removed from the screen tubes drops to the bottom of the filter compartment where it is removed by chain-driven dragout flights. The cycle automatically resumes filtering. *Write*: Department FM-297, Industrial Filtration Co., Lebanon, Ind. *Phone*: 1877

Drilling Machine

This unit drills to a depth of 24 in., with a maximum drift of only 0.001 to 0.0015 per foot of depth.



Spindles operate over 36 sq ft without resetting the material. Rapid indexing controls eliminate layout and drill jigs.

The single flute gun drill can be used at 300 to 5000 rpm. *Write*: Lahr Machine & Tool Corp., 3400 Maplewood Ave., Toledo 10, O. *Phone*: Cherry 3-1271

Cold Drawn Tubing

High and low pressure diesel fuel injection tubing comes in random coil lengths (minimum 40 ft, maximum 60 ft).

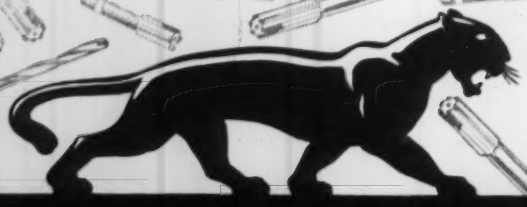
The seamless tubing is made in four sizes: ¼-in. OD and 0.120 in. ID; ¼-in. OD and 0.060 in. ID; 5/16-in. OD and 0.072 in. ID; ⅜-in. OD and ⅛-in. ID.

High pressure tubing is for systems with working pressures up to 9000 psi; low pressure tubing is for systems with lower working and surge pressures.

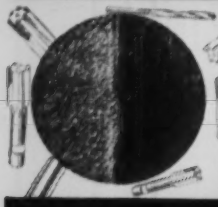
After the finish draw, the tub-

...the perfect way
NOT
to buy fasteners!
When you purchase FASTENERS, your first considerations should be given to quality, delivery and prices.
Chandler, as a leading manufacturer of cold forged cap screws, takes the same considerations. Mass production is only part of their story . . . but absolute control during every phase of production means top quality and uniformity.
Realistic pricing is important . . . and is followed.
If your requirements include automotive, Place self-locking, connecting rod or aircraft engine bolts in high carbon alloy and stainless steels, check with Chandler today. They are prepared to produce special heads, drilled heads and shanks, and ground bolts to tolerances as close as 0.0005-inch.
Write today for literature.
Specialists in Thread-Rolling after Heat Treating.
CHANDLER
PRODUCTS CORPORATION
1488 Chardon Road • Cleveland 17, Ohio

SMOOTH
but plenty tough!

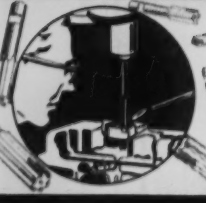


WENDT-SONIS tools cut fast and clean . . . stay sharp

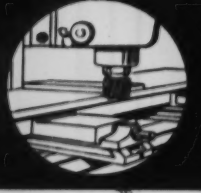


Micro-photograph, 100 diameters, shows how Flo-Finish (left) eliminates grinding marks on Wendt-Sonis tools. Actually 30% smoother — by profilometer readings — than normal ground finish (right).

With 30% smoother finish on tools, chips flow out of the flutes quickly and smoothly. On drills, for example, carbide tips are carefully blended to the contour of the flutes — tools are then given Flo-Finish after polishing.



Tools cut fast, provide a good finish and stay sharp — thanks to 30% smoother Flo-Finish. When it comes to reaming, you can't beat Wendt-Sonis on smoothness, or toughness!



30% smoother Flo-Finish is furnished on *all* Wendt-Sonis round tools at no extra cost. So Wendt-Sonis end mills too are smooth . . . and tough!

SEND FOR FREE 94-PAGE CATALOG No. 55 — ADDRESS DEPT. SM-1156

WS **WENDT-SONIS COMPANY**

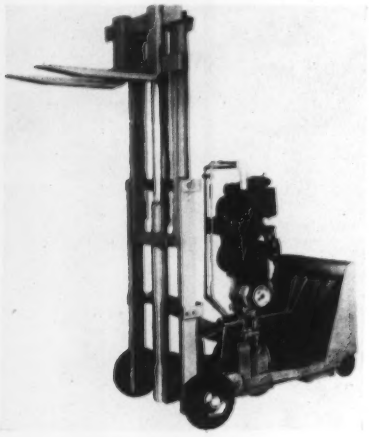
Hannibal, Missouri • Rogers, Arkansas

NEW PRODUCTS and equipment

ing is annealed to produce a soft ductile material suitable for cold swaging, upsetting and bending. *Write*: Superior Tube Co., Germantown Ave., Norristown, Pa. *Phone*: Norristown 5-2070

Lift Truck

An 84-in. lift is provided by the D-15 lift truck which can stack in 103-in. aisles.



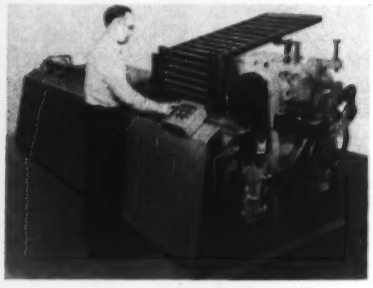
Turning radius is 64 in. The mast tilts 10 degrees backward and 3 degrees forward. *Write*: Truck-Man Division, Knickerbocker Co., 657 Liberty St., Jackson, Mich. *Phone*: State 2-7181

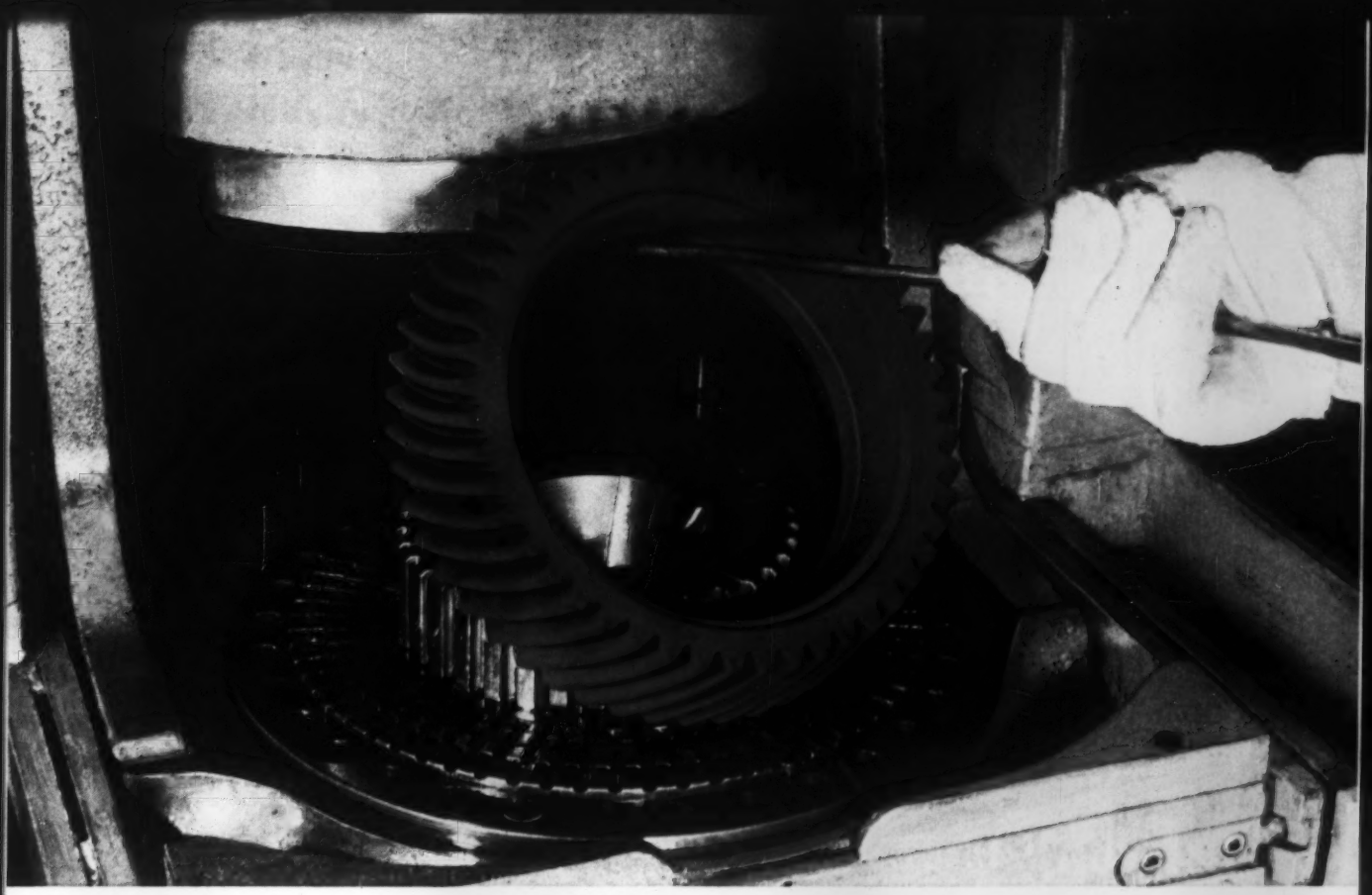
Bending Machine

Tubes up to 2 in. in diameter can be bent up to 180 degrees by this machine. On bends with short legs, the machine will operate continuously, eject parts automatically.

The machine can make 650 bends which are 30, 45 or 90 degrees in an hour.

A two-pump hydraulic system is used. One pump controls a 2000-





How to hold close tolerances when you quench gears and other parts

If you make parts like this aircraft transmission gear, you know that warpage or distortion during quenching means losing the time and money you've spent machining the part to close dimensional tolerances.

You can avoid such costly losses with Gleason Quenching Equipment.

The hot gear above, for example, is being set on the lower die of a Gleason Quenching Press. A button is pressed and the automatic quenching cycle is started. The lower die is swung back into the quenching position and the upper die descends rapidly, aligning the part while it is still in the plastic state.

The dies securely clamp the gear, but are so designed to permit it to contract in the normal manner, while still holding the gear true.

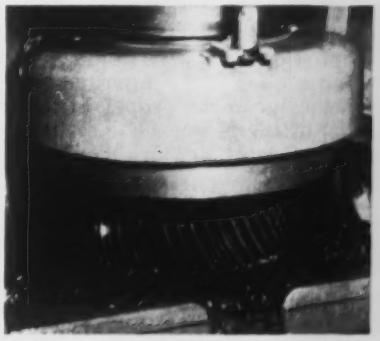
Carefully controlled, metallurgically correct oil circulation hardens the gear to perfection.

Post-quench tests show the gear meets all specifications.

You can give *any* part, regardless of shape, the same distortion-free quenching.

Three sizes of the Gleason Quenching Press harden parts up to 36″ diameter. Another press automatically hardens and straightens shafts and shaft parts up to 40″ in length.

For literature and recommendations on the press and die equipment that fit your products, send us blueprints.



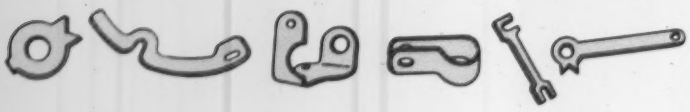
The Gleason Quenching Press forces oil uniformly over and around the part, assuring the correct hardness and distortion-free quenching.

GLEASON WORKS

Builders of bevel gear machinery for over 90 years

1000 UNIVERSITY AVE., ROCHESTER 3, N. Y.

How to SAVE on STAMPINGS

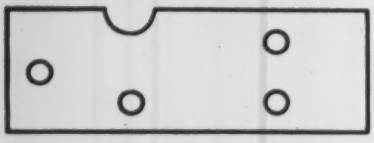


If you buy stampings, it will pay you to read these important suggestions. They will help *us* to help *you*... (1) with faster deliveries... (2) with lower prices.

Your blueprint and the data on it are our bible! We must assume that all tolerances and limitations shown are strictly essential to the functioning of the finished part.

We want to—and we will—give you *exactly* what you require. But if there are unnecessary restrictions or requirements you'll be paying more than you need to. You don't like that. We don't either.

FOR EXAMPLE:



Here's a simple, hypothetical stamping. Tolerances for all the holes and the slot are specified "plus or minus .001"—so we assume such close tolerances are essential to the proper functioning of the piece.

In the light of these close tolerances, your part would cost you $X per M. In effect *you* set the price. We don't. But your parts, when you get them from *this* shop, will meet every one of those specs.

Now, from long experience, we know that in many cases like this some of the requirements *could* be relaxed.

Let's say, for example, that plus or minus .003 is actually adequate for 3 of the 4 holes and the slot. It's comparatively easy to hold to .001 on *one* hole if there's a latitude of plus or minus .003 on the other holes and the slot.

How would these modifications affect what you pay? Your cost would be a *fraction* of $X per M, probably a *small* fraction. That would make *you* happy, *and* us too.

OTHER WORTHWHILE POINTS:

Quantities. Order maximum. Higher quantities mean lower unit cost. Three runs of 2,000 can't cost the same as one run of 6,000.

Short Runs. If you want *short run* stampings, try to set your tolerances accordingly. It isn't practical to hold the same tolerances in Short Runs as in Production Runs.

De-burring. If you must have *all* burrs removed that's readily done. But if *smooth pieces* will do, don't specify "Remove all burrs." You'll save money.

Punched Holes. When specifying hole size try to specify a standard punch size. Saves you the cost of a custom made punch.

A WORD TO THE PURCHASING AGENT:

When requirements or specs appear more stringent than necessary, we question them with the customer. But this takes time. **Therefore—to help save time and money—we suggest you do not include any specification, tolerance or limitation for which you are not willing to pay.**

For more complete information, send for our free 12-page booklet, "Service in Stampings"

—STAMPINGS DIVISION—

"One Piece or a Million"

3411 Union Street, Glenbrook, Conn.

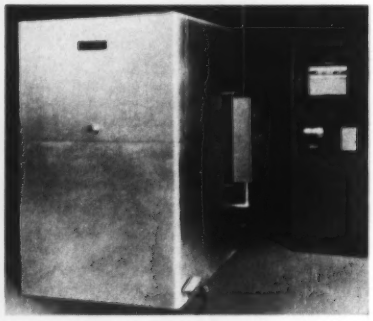
LAMINATED SHIM COMPANY, INC.

NEW PRODUCTS and equipment

psi clamping system and the other powers the 1000-psi bending system. *Write*: Walter P. Hill Inc., 22184 Telegraph Rd., Detroit 19, Mich. *Phone*: Kenwood 4-9190

Electric Furnace

Model AR is a streamlined unit with a gastight controlled atmosphere. Large section, chrome-nickel ribbon elements are formed into sinuous loops and slid into grooves in the refractory lining.

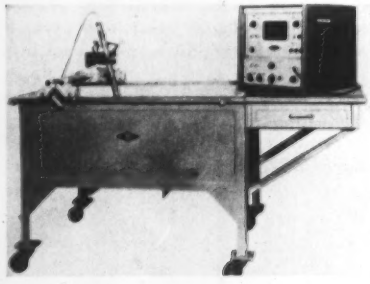


The transformer installed in the base of the furnace has either a 220 or 440 volt primary and a 110 volt secondary.

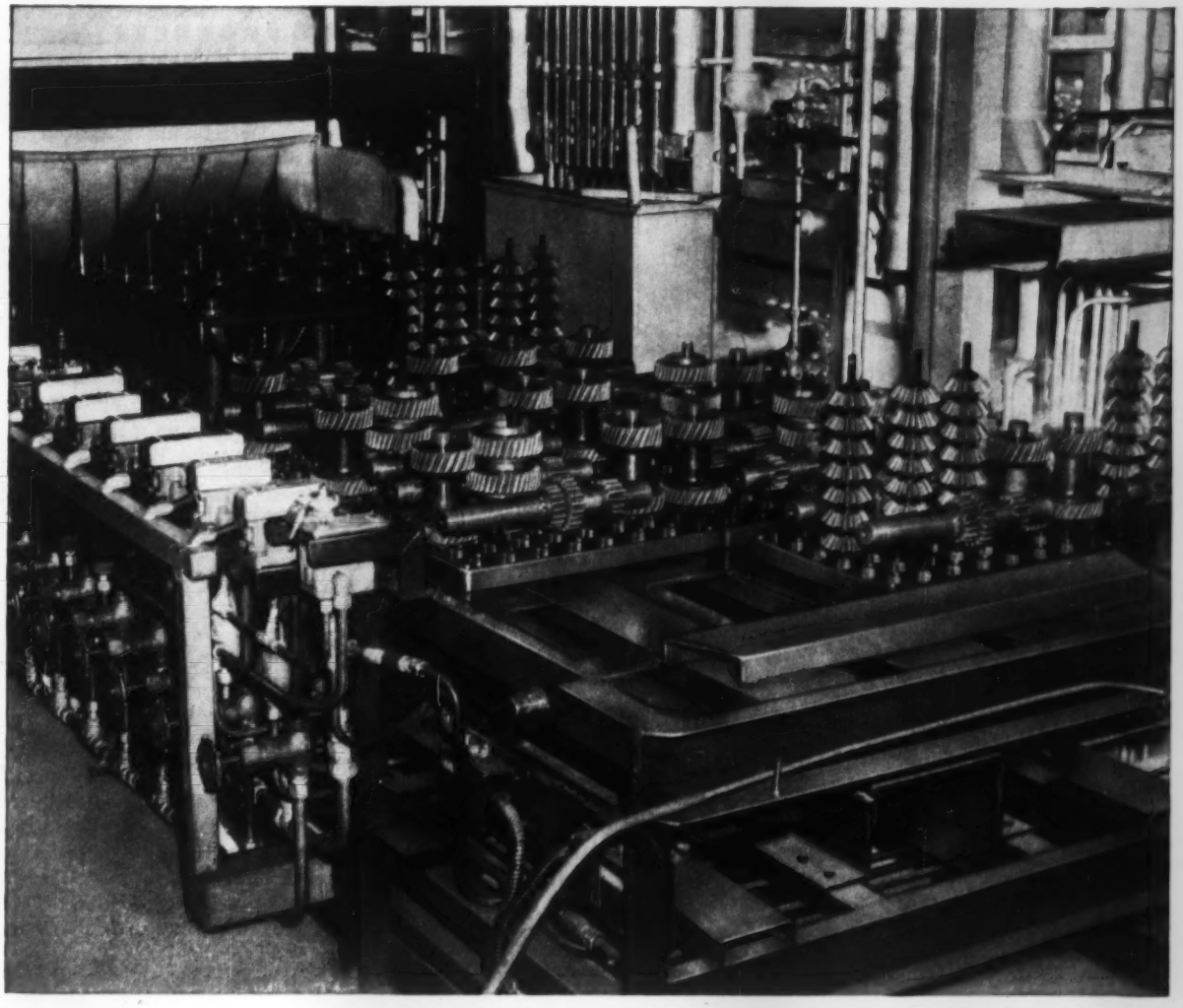
Furnace capacities range from 18 x 10 x 6 in. to 48 x 28 x 21 in. *Write*: Department 9, Waltz Furnace Co., Symmes St., Cincinnati 6, O. *Phone*: Capital 1-2444

Ultrasonic Testing

Model PT1001 is a portable unit consisting of an Immerscope, a 4-ft immersion tank, search tube and rack, precision manual manipulator, longitudinal and traverse scanner and a complement of crystals.



Procedure for inspection: Metal parts are placed in the water tank, where they are scanned with ultrasonic waves which are record-



Surface zoned gas carburizing toughens gears, cuts steel costs

The manufacturer of these heavy duty truck gears improved metallurgical properties and reduced material and labor costs when he adopted Surface zoned gas carburizing. Unique atmosphere manifolding enables him to limit surface carbon content (80% max.), get sufficient case depth, and still maintain good carburizing rates (530-900 net lbs./hr.). With the quality of Surface carburizing, he could use steels lower in alloy content.

Cases like this explain why 1,500,000 cfh of atmosphere gas are generated daily in Surface generators. For quality carburizing at competitive costs, check with Surface.

SEND FOR BULLETIN SC-172 • SURFACE COMBUSTION CORPORATION • 2385 DORR ST., TOLEDO 1, OHIO

Surface® Heat Treat, Steel Mill, Glass Divisions • Kathabar® Air Conditioning Division
Janitrol® Heating and Air Conditioning Division • Janitrol® Aircraft-Automotive Division

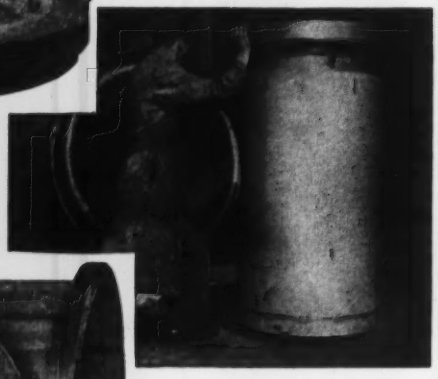
Surface
HEAT TREATING EQUIPMENT

ROLOCK
FABRICATED ALLOYS

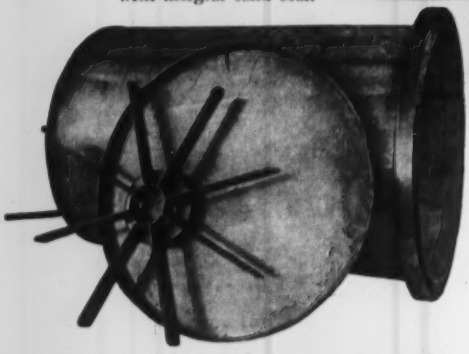
HEAT AND CORROSION RESISTANT

Engineered
FURNACE RETORTS
that SERVE BETTER
LAST LONGER
COST LESS
per furnace hour

Stainless steel hoods for bell-type bright annealing furnaces. 77" O.D. x 88" high.



A special and very successful Rolock design with integral sand seal.



A special design built within a few days without costly patterns.

Here are three of the important furnace retort designs currently fabricated by Rolock specialists . . . each making an impressive record of excellent, low-cost service. Essential features include experienced design and construction engineering . . . unique Rolock know-how and experience in fabricating modern high-heat-resistant wrought alloys . . . quality standards maintained and safeguarded by detailed X-ray and other forms of inspection. Write for our new comprehensive catalog, or send your prints for quotation.

SALES AND SERVICE REPRESENTATIVES FROM COAST TO COAST

ROLOCK INC., 1262 KINGS HIGHWAY, FAIRFIELD, CONN.

JOB-ENGINEERED for better work
Easier Operation, Lower Cost

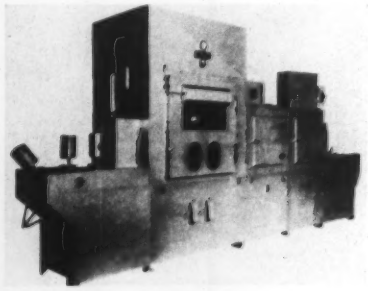
SRLS6

NEW PRODUCTS and equipment

ed as pips on the Immerscope screen. Defects are indicated by variations of the pip pattern. They are located with the precision manipulator. *Write*: Industrial & Scientific Products Division, Curtiss-Wright Corp., Caldwell, N. J. *Phone*: Caldwell 6-7200

Wet Blasting

This Pressure Blast machine eliminates wire brushing on cast iron and aluminum pistons ranging up to 42 lb.



Another new machine deburrs automatic transmission components. Rinsing and rustproofing operations are automatic on both. *Write*: Cro-Plate Co. Inc., 747 Windsor St., Hartford 1, Conn. *Phone*: Jackson 7-8273

Strapping Dispenser

The operator controls the length of strap fed through the jaws of this dispenser with a pushbutton. When the right length has passed

Make speed reduction
A COST-REDUCTION FEATURE
of any drive design

When you design around the 100 SERIES, you can be sure that any model you need is available promptly, — from stock. You can be sure, also, that any BOSTON GEAR Speed Reducer will take top-rating in any test for operating efficiency, and lasting power economy.

Get complete information . . . call your local BOSTON GEAR Distributor and talk to the transmission specialist. Boston Gear Works, 73 Hayward St., Quincy, Mass.

1605
types and ratios
FROM STOCK

BOSTON Gear

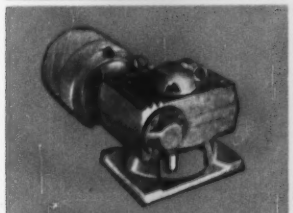
100 SPEED REDUCERS

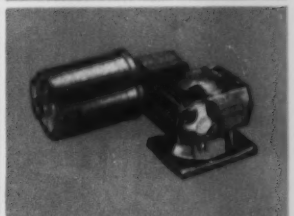
RATIOMOTORS

Output RPM
.49 to 175

Horizontal Right Angle Drive

Double Reduction Horizontal Parallel Drive


Vertical Right Angle Drive


Double Reduction Vertical Right Angle Drive

REDUCTORS

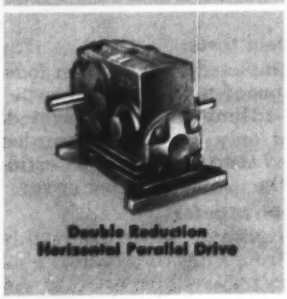
Ratios 1:1 to 3600:1

Fan-cooling optional on larger sizes

Horizontal Right Angle Drive Worm Gear over

Horizontal Right Angle Drive Worm Gear under

Vertical Right Angle Drive


Double Reduction Horizontal Parallel Drive

Double Reduction Vertical Right Angle Drive

All Ratiomotors are sold also WITHOUT MOTORS as

FLANGED REDUCTORS

You buy and attach motors of your choice

Ratiomotor "COMBINATION" design permits easy motor change . . . continued operation with spare. Motor is easily detachable, can be changed in minutes. Gear unit is undisturbed, preserving alignment. Also, original motor can be replaced with another type (explosion-proof, etc.) at anytime.

7124 STANDARDIZED TRANSMISSION PRODUCTS FROM LOCAL STOCKS — AT FACTORY PRICES
Ask for Catalog No. 56

CALL YOUR BOSTON Gear® DISTRIBUTOR

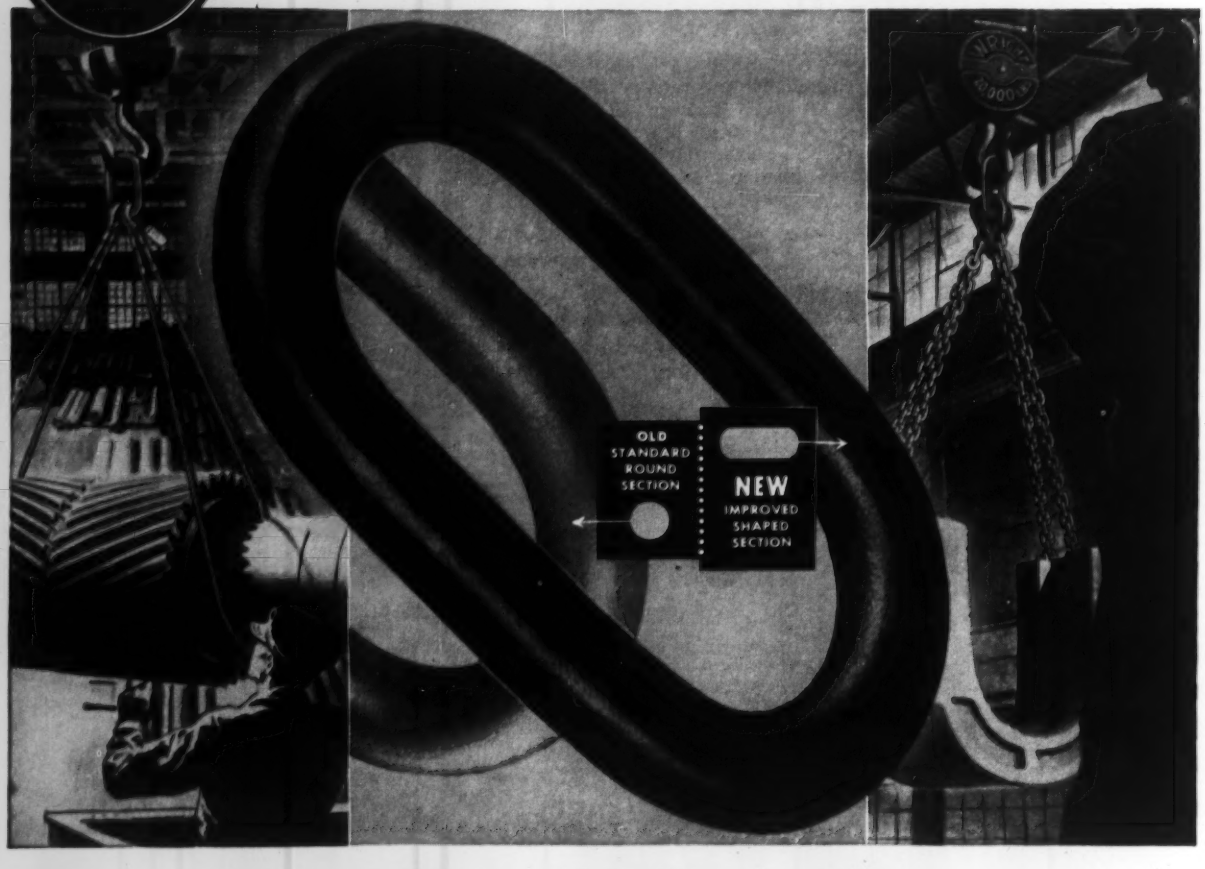
For nearest Distributor, look under "GEARS" in the Yellow Pages of your Telephone Book.

Ad No. 56BG-R-20A

ACCO products

ACCO Registered* Slings–Wire Rope & Chain

THE STANDARD OF EFFICIENCY AND SAFETY



An Extra Bonus of Safety for Slings—
THIS NEW SHAPED MASTER LINK

• ACCO's engineers found that if they shaped the master links for chain and wire rope slings as shown above, these new shaped links would hold their form under loads up to 18% greater than could the old standard round links. The reasons are similar to those which enable a shaped I-Beam to handle greater loads than could the same amount of steel if used as a solid beam.

The new link is smoother and provides a greater factor of safety. It is a better link in many ways. It costs us more to make. Yet it is offered at no increase in price.

"Registered*"—for Greater Safety

Development of this new link is just the latest step in ACCO's continuing program to provide the greatest possible measure of safety and reliability in ACCO *Registered* Slings.

Each component of an ACCO *Registered* Sling is made from the best materials procurable for its use. Each part must prove to have strength equal to or greater than the sling body. All hooks for ACCO *Registered* Slings are Magnaflux tested. Then these components are assembled into slings according to carefully engineered designs that have proved themselves in rigorous field tests.

The completed sling is then individually proof-tested to twice the working load limit for which it is rated. Then, and only then, is it awarded the coveted ACCO Registration Certificate and the identifying ring or tag.

See your Distributor

ACCO *Registered* Slings are readily available from a distributor near you. If you don't know him write to our Bridgeport office for his name.

*Trade Mark Registered

ACCO

AMERICAN CHAIN & CABLE

BRIDGEPORT, CONN.

Atlanta, Boston, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Wilkes-Barre, Pa., York, Pa.
In Canada: Dominion Chain Co., Ltd., Niagara Falls, Ont.

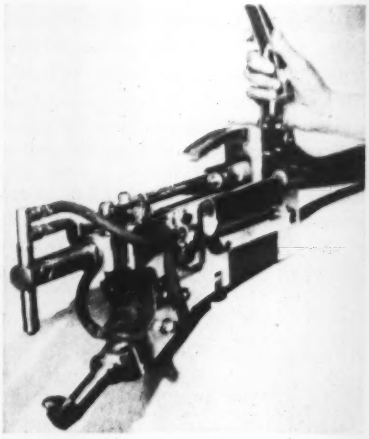
Better Value

through, the button is released and the strap halted.

Pulling the cutter handle severs the strap in 2 to 4 seconds. The machine feeds at a rate of 6 to 10 ft a second. *Write*: Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Ill. *Phone*: Armitage 6-8500

Spot Welder

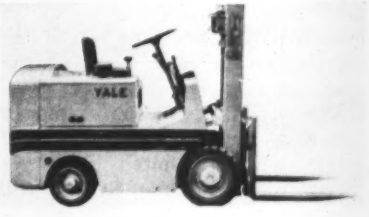
Model 192's one-headed operation reduces operator fatigue. It has a high welding current for its size.



A convenient lever lowers and raises the bottom arm to speed up production. Spring pressure is easily adjustable. *Write*: Aro Spot Welders Division, Guthery Machine Tool Corp., 38-31 Crescent St., Long Island City 1, N. Y. *Phone*: Exeter 2-4090

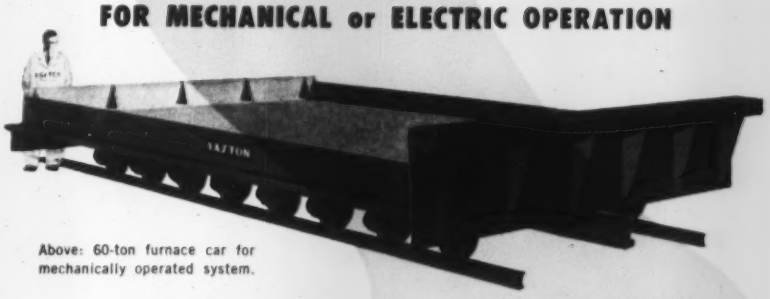
Lift Truck

This gas-powered model is protected from abrasive dusts in five ways.



A tandem air cleaning system filters air going into the carburetor. Air first passes through a dry-type precleaner, then through

Furnace Cars
FOR MECHANICAL or ELECTRIC OPERATION



Above: 60-ton furnace car for mechanically operated system.

CUSTOM-BUILT and quality-built for dependable service. Easton experience includes all types of furnace and transfer cars for modern heat treating systems. Built to any desired capacity.

Write or telephone for technical information.

OUR 42ND YEAR

EASTON
EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA.

A-1098

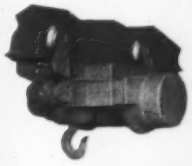
SERIES HB—
The High Quality Heavy Duty
EUCLID HOISTS

These hoists are highly efficient and strictly modern in every detail with oversize anti-friction bearings and heat treated steel parts in combination with a welded frame.

The planetary gearing and mechanical load brake are mounted in oil tight housings. The hoist gearing is assembled in the hoist drum.

This design produces an unusually compact, rugged and accessible hoist readily adapted to various installations and types of control.

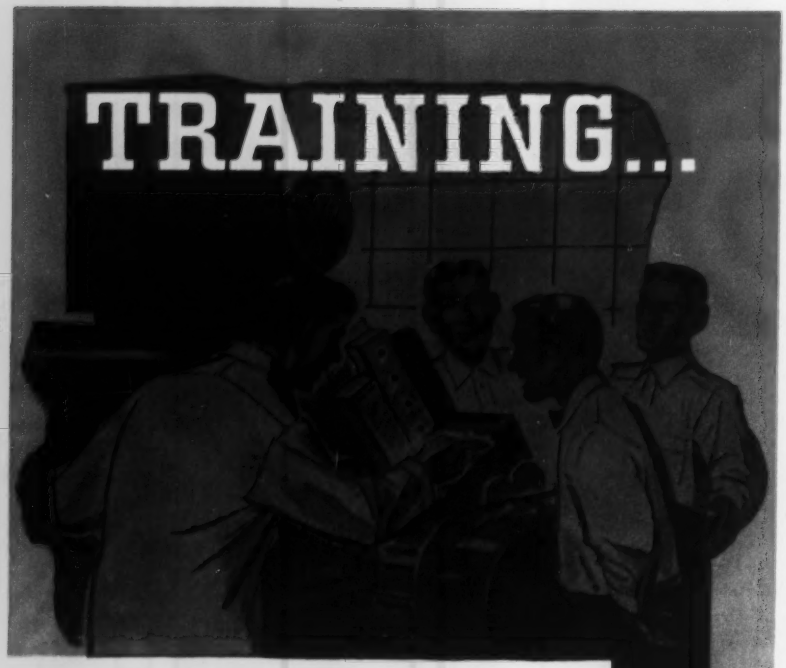
Parallel mounted hoist with cone trolley drive.



Low headroom cross-mounted plain trolley hoist.

Write for the HB Hoist literature illustrating and describing the many features.

THE EUCLID CRANE & HOIST COMPANY
1365 CHARDON ROAD, CLEVELAND, OHIO



When you buy *Acme-Gridley*
you get **SERVICE**
ANYTIME, ANYWHERE

While your Acme-Gridley is being assembled, you may send your men to our plant to learn about tooling, camming and maintenance of your machine to insure *continued* top performance. Or, a competent demonstrator will perform the same function at your plant, upon delivery of your machine.

Either way, this service is supplemented by numerous service books, instruction manuals and parts catalogs. And, if you start a *training program*, this supplemental material will implement it.

National Acme

The NAMCO nameplate on your machine assures service — in emergency or normal situations — when and where you need it.

THE NATIONAL ACME COMPANY • 189 East 131st Street, Cleveland 8, Ohio

NEW PRODUCTS and equipment

a heavy duty oil bath cleaner. The precleaner is mounted on the top of the hood, placing the intake away from air contaminated by action of the fan.

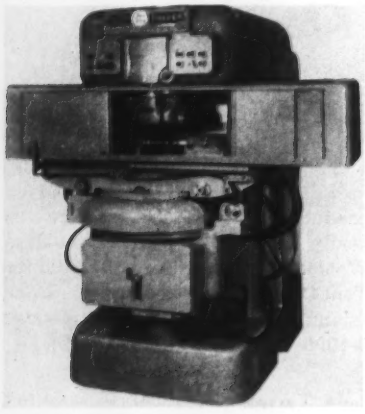
A heavy duty air filter is provided for the crankcase breather pipe.

The bottom of the truck is protected by a deflector plate which keeps foreign particles on the floor from being drawn up into the engine compartment.

The generator and voltage regulator are enclosed to preserve commutator surfaces and extend brush and contact life. *Write*: Yale Materials Handling Division, Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa. *Phone*: Orchard 3-1200

Gear Shavers

A new column design and built-in pushbutton controls are featured by Red Wing models GCU-8 and GCU-12.

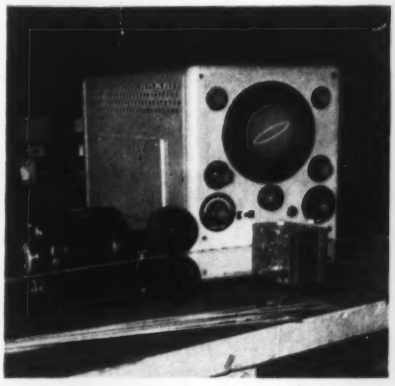


Tunnels cast in the column of the rotary gear shavers provide space for electrical controls. This construction also permits the two pushbutton control panels to be mounted flush with the top of the column within easy reach of the operator.

Model GCU-8 will shave spur or helical gears up to 4 diametral pitch that have pitch diameters from 1 to 8 in. Model GCU-12 will handle gears with pitch diameters up to 12 in. *Write*: National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich. *Phone*: Walnut 1-8980

Case Studies:
NONDESTRUCTIVE TESTING SYSTEMS

SPOTCHECK PINPOINTS DANGER AREAS in heavy machinery and operating equipment. The Spotcheck dye penetrant inspection kit is excellent for testing during maintenance, or for intermittent spot testing for cracks and other surface defects. Kit contains all materials in easy-to-use pressurized spray cans plus a handy, lightweight carrying case.



NOW YOU CAN "SEE" DEFECTS in wires, rods and tubes of low conductivity metals such as aluminum, tungsten or uranium. The FW-200 Series unit sets up eddy-currents in the test materials. Using frequencies from 15 KC to 2 MC, any cracks, splits or seams are detected and easy-to-read indications are shown on the TV-type picture tube. Diameter changes register separately. Adjustments can be made for a visible signal and automatic rejection of defective materials.

HALLMARK OF QUALITY IN NONDESTRUCTIVE TEST SYSTEMS

Write for complete details concerning any of the above case studies, or ask for our new booklet on "Lower Manufacturing Costs."

Type ZA-29 Zyglo unit is widely used and accepted for detecting surface defects in aluminum magnesium, brass and titanium parts.

How Production, Payroll and Public Relations Can Benefit from "Early-Stage" Testing

The most for the least, that's what your customers want today. To help answer these demands and still show a profit, you can increase the output and quality of production without increasing costs and facilities.

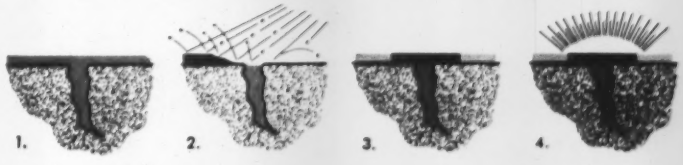
By supplying process control and by maintaining consistent quality standards, Magnaflux nondestructive testing systems provide a quick, accurate, economical production tool. They can increase output and lower your operating costs. M methods save money by keeping production at a dependable level.

M methods provide an "early-stage" test for the detection of surface defects in all magnetic and non-magnetic metals, ceramics, glass and other solid materials. "Early-stage" testing pinpoints improper procedures and corrective steps can be taken to eliminate the manufacture of defective parts. Where serious defects do occur, parts can be rejected before further effort is wasted on additional processing. When defects are minor, repairs can be made to decrease scrap losses and upgrade salvage operations.

"Early-stage" testing with M methods pays in many ways. It increases usable production output, it prevents unnecessary payroll costs on defective materials, it protects your reputation by insuring consistent quality, all of which means dollar savings to you!

Find out how low-cost Magnaflux nondestructive test methods can help protect your company's quality, pocketbook and name. Write, or call on a Magnaflux testing systems engineer today.

HOW ZYGLO FINDS CRACKS IN NON-MAGNETIC PARTS



1. A surface film of Zyglo penetrant is applied to parts by dipping, spraying or brushing. After this application, penetrant enters any surface opening, cracks or pores, and excess penetrant is allowed to drain off. 2. Parts are then washed with a water spray, and permitted to dry. 3. Next, parts are dipped in a developing powder. This acts as a blotter, and draws the penetrant to the surface. 4. Look at the part under "black light". Any crack or surface defect will show up as a glowing fluorescent indication that is impossible to miss. Scratches will not be shown.

Take Your Inspection Problems to the House of Answers

MAGNAFLUX CORPORATION

7312 West Lawrence Avenue • Chicago 31, Illinois

New York 36 • Pittsburgh 36 • Cleveland 15 • Detroit 11 • Dallas 19 • Los Angeles 58

NEW literature

Write directly to the company for a copy

Milling Cutters

High speed steel and carbide cutters are described in bulletin 561, 29 pages. Viking Tool Co., 1000 Nichols Rd., P.O. Box 471, Shelton, Conn.

Slitting Lines

This 16-page bulletin, 569, presents a line of rotary gang slitters for mills, warehouses and strip users. Stanat Mfg. Co. Inc., 47-28 37th St., Long Island City, N. Y.

Speed Reducers

Catalog B-6727, 44 pages, gives horsepower ratings, torque capacity, overhung load values, dimensions, construction features, installation and maintenance information for single, double and triple speed reducers. Westinghouse Electric Corp., P.O. Box 2099, Pittsburgh 30, Pa.

Automatic Filters

Bulletin 909, 10 pages, uses drawings, dimension charts and flow curves to describe water filters. R. P. Adams Co. Inc., 322 East Park Drive, Buffalo 17, N. Y.

Hook Bearings

Thrust bearings for crane hooks with capacities of 5 to 250 tons are described in bulletin 956, 4 pages. Rollway Bearing Co., 541 Seymour St., Syracuse, N. Y.

Coil Grabs

Here's a 4-page bulletin that describes grabs for handling various types of coils. Mansaver Industries Inc., 3105 East St., New Haven 11, Conn.

Socket Screws

This 4 - page bulletin describes socket setscrews; socket head capscrews; button and flathead socket capscrews; shoulder screws and precision dowel pins. Cleveland Cap Screw Co., Box 579, 2917 E. 79th St., Cleveland 4, O.

Lubrication

Bulletin 60-A, 8 pages, describes spray lubrication systems for open gearing and slide surfaces. Farval Corp., 3249 E. 80th St., Cleveland 4, O.

Carbide Tools

A selection of carbide-tipped milling cutters are presented in bulletin 56, 6 pages. Nelco Tool Co., Manchester, Conn.

Grinding Wheels

This 4-page bulletin describes resin bonded reinforced wheels for rough grinding, reducing heavy welds, undercutting and notching. American Emery Wheel Works, Providence 1, R. I.

Sheet Feeder

This 6-page bulletin describes a feeder that handles 125 metal sheets a minute. Dexter Folder Co., 330 W. 42nd St., New York 36, N. Y.

Live Storage Racks

Bulletin RA-56, 6 pages, describes the live storage principle and presents engineering details, available components and illustrations of typical installations. Alvey-Ferguson Co., Cincinnati 9, O.

Thread Rolls

Bulletin 1-16, 8 pages, describes standardized thread rolls and holders for single roll application. Reed Rolled Thread Die Co., P.O. Box 350, Worcester 1, Mass.

Wire Rope Assemblies

Bulletin 5601, 24 pages, gives specifications of terminal fittings, such as threaded stud, oval eye, pin eye, clevis, hook, fork and turnbuckle,

and the wire rope that is used with them. Public Relations Department, Macwhyte Co., Kenosha, Wis.

Shipping Boxes

This 24-page booklet describes the steps in the development of corrugated boxes. Hinde & Dauch Paper Co., Sandusky, O.

Silver Brazing

Oxidation characteristics of silver brazing alloys in the 500 to 1100°F range are depicted in bulletin T-10, 4 pages. Handy & Harman, 82 Fulton St., New York 38, N. Y.

Overhead Conveyor

A combination of powered and free operating conveyors for handling loads through stage processing, intermittent storage or stop-and-go operations is described in a 4-page bulletin. Chainveyor Corp., 5618 E. Washington Blvd., Los Angeles 22, Calif.

Barrel Finishing

Form 501 is a 76-page booklet which gives information on barrels, selection of abrasive and cleaning compounds, time cycles and other factors in barrel finishing. Norton Co., Worcester 6, Mass.

Vertical Filing

Four methods of vertically filing blueprints, maps, etc., are presented in bulletin 5, 8 pages. Plan Hold Division, Air Comfort Co., 5204 Chakemco St., South Gate, Calif.

Fluorescent Lighting

Bulletin B, 36 pages, contains descriptions, illustrations and lighting data on 394 industrial lighting units. Benjamin Electric Mfg. Co., Des Plaines, Ill.

Transformer Instructions

Information on the operation and maintenance of distribution transformers is given in bulletin DL-1, 8 pages. Advertising Department, Moloney Electric Co., 5390 Bircher Blvd., St. Louis 20, Mo.

Time Controls

This 20-page bulletin gives information on multipurpose time switches and industrial timers. Paragon Electric Co., Two Rivers, Wis.

Welding Positioner

Cumbersome frames and bases weighing up to 24,000 lb are handled by the positioner described in bulletin R-1700-S17 P, 2 pages. Positioning Equipment Division, Worthington Corp., Plainfield, N. J.

Pressure Tubing

Bulletin TDC-146A, 4 pages, gives data on pipe, tubes and welding fittings for high temperature service. They are made of chromium-molybdenum alloy steel. Tubular Products Division, Babcock & Wilcox Co., Beaver Falls, Pa.

Welding Rod

Bulletin 56L-171 describes a high-strength manganese bronze filler rod for maintenance oxyacetylene welding. Ampco Metal Inc., 1745 S. 38th St., Milwaukee 46, Wis.

Air Cleaning

Bulletin 557-D, 4 pages, discusses the cleaning of atmospheric air with special cloth filters. Wheelabrator Corp., 1157 S. Byrkit St., Mishawaka, Ind.

Chain Slings

Catalog 719, 42 pages, describes a variety of chain slings, their fittings and accessories. Advertising Division, Republic Steel Corp., 3100 E. 45th St., Cleveland 27, O.

Torque Motors

Torque motors, special motors and collector rings for completing electric circuits between stationary and rotating parts are covered in bulletin

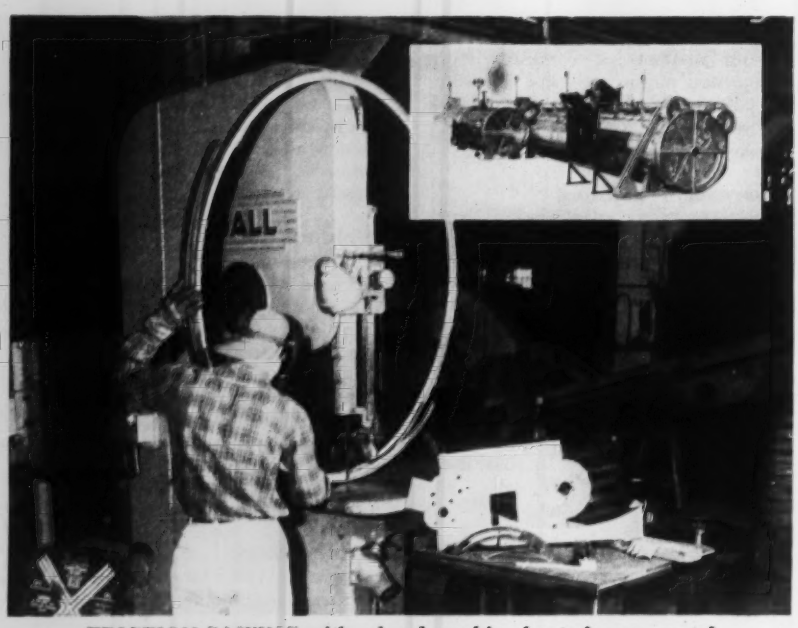
FOR CUSTOMIZED CONVEYORS WITH MAY-FRAN STANDARDIZATION

Developed to provide the ultimate of versatility, the May-Fran program of STANDARDIZATION permits users to create and construct their own conveyors to meet individual needs.

It literally provides a type of "super market" shopping for the straight, curved, inclined, take-up and discharge end sections required to meet the specifications of YOUR job requirements. Sections can be furnished to meet belt width as well as load bearing and volume capacities. Conveyors can be changed relative to length or width with only a minimum of downtime.

MAY-FRAN ENGINEERING, INC.
1725 Clarkstone Rd. • Cleveland 12, Ohio

Write today . . . ask for a copy of MF Bulletin No. 200



FRICTION SAWING with a band machine heats ferrous metal to the softening point, speeds cutting tremendously.

Today's Bargaining Table is Set with Tools

Reality has caught up with the collective bargaining table. Progressive labor leaders subscribe to the concept that the employer and the man who runs the machine are both in the same boat. Only through installation of more and better "tools" can office workers and machine operators attain higher wages, and the employer be assured of not having his boat sunk by a more efficient competitor.

Are tools really the key? Consider the illustration above. A friction saw is being used to cut stainless steel rings for cookers used in the canning industry. In this machine, developed by The DoALL Company, the saw band travels so fast it makes the work piece red hot at the point of cut. The saw teeth cut through this softened metal at an amazing rate. This job is now being done for 50¢ per ring. Formerly, with conventional sawing, it cost $5.00.

Better tooling has saved $4.50 in shaping a small part for the big cooker. Add comparable machining efficiencies to other parts and the manufacturer has a better cooker at lower cost. His competitors must keep pace or owners and employees alike will be outside looking in.

HUGE COOKERS, efficiently produced with modern tools, make canned goods available in abundance at prices consumers can pay.

There isn't much point in bargaining for higher wages if you can't produce more to pay the wages. That's why enlightened labor leaders are demanding "labor-saving" tools which are in reality "wage-increasing" tools.

NEW DoALL CONTOUR-MATIC band machines will saw, slice, grind, file, polish any solid material—cut any shape. Ask for literature.

Reprints available for your employees.

The DoALL Company

Des Plaines, Illinois

38 Local Sales-Service Stores E-24

NEW LITERATURE

BAW-56, 8 pages. B. A. Wesche Electric Co., 1623 Vine St., Cincinnati 10, O.

Aluminum Forgings

This 16-page bulletin discusses the advantages of hand forgings for limited production runs. Aluminum Co. of America, Room 787, Alcoa Bldg., Pittsburgh 19, Pa.

Flaw Testing

The dye penetrant method of inspection is described in a 4-page bulletin. Turco Products Inc., 6135 S. Central Ave., Los Angeles 1, Calif.

Cleaning Compounds

A complete line of industrial cleaning compounds and solvents is covered in this 8-page bulletin. Brulin & Co. Inc., 2939-45 Columbia Ave., Indianapolis 7, Ind.

Circular Sawing

This 4-page bulletin describes a machine which saws small diameter stock. Motch & Merryweather Machinery Co., Penton Bldg., Cleveland 13, O.

Fabricated Tubing

Cost saving advantages of steel tubing are covered in a 4-page bulletin. Product Information Service, Armco Steel Corp., Middletown, O.

Universal Joints

Here's an 8-page catalog that gives the performance characteristics of universal joints and driveshafts. Detroit Bevel Gear Co., division of Gear Grinding Machine Co., 8130 Jos. Campau, Detroit 11, Mich.

Batteries

This 8-page bulletin details the construction of batteries for industrial trucks. Gould-National Batteries Inc., Trenton 7, N. J.

Steel Tubing

Bulletin MST-856, 4 pages, describes electric welded mechanical steel tubing. Mechanical Steel Tubing Department, Walker Bros., Conshohocken, Pa.

Thickness Control

Systems for measuring and controlling strip thickness are described in bulletin B1556, 12 pages. Industrial Nucleonics Corp., 1205 Chesapeake Ave., Columbus 12, O.

X-Ray Diffraction

Theory, uses and procedures used in x-ray diffraction are presented in a 4-page bulletin. X-Ray Department, General Electric Co., Milwaukee 1, Wis.

MEMO TO: *You*

YOU MIGHT AS WELL try to count the beans in a carload as the number of parts that are made of Roebling High Carbon Specialties, Flat Wire and Spring Steel. These Roebling products are unsurpassed for mechanical and dimensional uniformity . . . for speeding manufacturers' production and cutting costs.

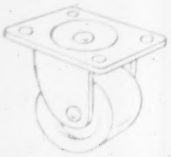
Next time you order cold rolled high carbon wire or spring steel specify Roebling. Strictly on its performance you'll probably become a steady customer from then on. John A. Roebling's Sons Corporation, Trenton 2, N. J.

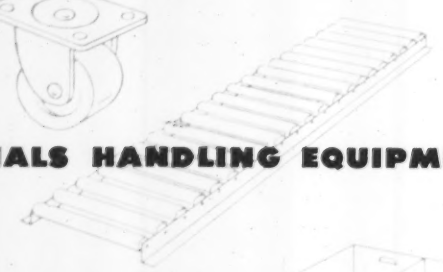
ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. & 5 PITTSBURGH ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 2340 GLENDALE-MILFORD RD., EVENDALE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • ROCHESTER, 1 FLINT ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • ST. LOUIS, 3001 DELMAR BLVD. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N.Y.

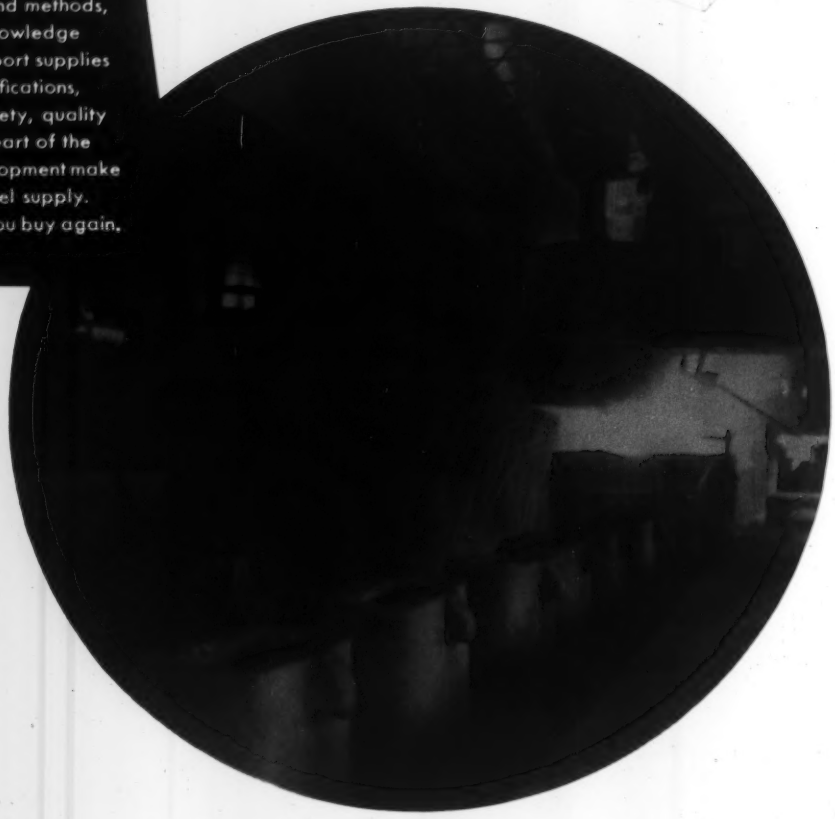
Acme-Newport Steel

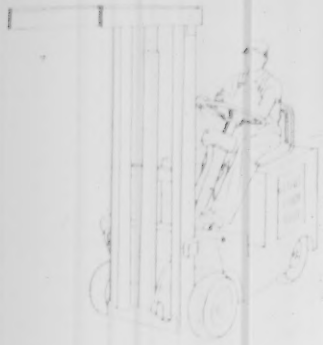




FOR MATERIALS HANDLING EQUIPMENT

Acme-Newport is a reliable source for steel for sturdy equipment that short-hauls the goods of America. Just as our products qualify for the manufacture of operating facilities, storage containers and consumer goods themselves. By combining modern equipment and methods, conscientious care and all the knowledge gained in 70 years, Acme-Newport supplies steel to meet your exact specifications, whatever its intended use. Variety, quality and favorable location in the heart of the nation's greatest industrial development make this a most logical source of steel supply. Consult Acme-Newport before you buy again.





ECONOMICAL WATERAIL-TRUCK DELIVERY

This Company is ideally situated on the Mississippi-Ohio River system and the great Cincinnati rail-truck hub. New barge facilities, 7 major railroads and 143 motor carriers enable Acme-Newport to give economical, dependable delivery to the entire area of the Middle West and South.

Acme-Newport Steel COMPANY

NEWPORT, KENTUCKY

A SUBSIDIARY OF ACME STEEL COMPANY

PRODUCTS . . . . . Cold-Rolled Sheets • Hot-Rolled Steel in Coil • Hot-Rolled Pickled Steel in Coil • Hot-Rolled Sheets • Hot-Rolled Pickled Sheets Electrical Sheets • Alloy Sheets and Plates • Electric Weld Line Pipe • Eave Trough and Conductor Pipe • Culverts

Market Outlook

INTERNATIONAL tension poses the question: How are we fixed for steel?

The answer: Better than ever before.

The U.S. has 33.3 per cent more steel ingot capacity than it had at the start of the Korean War six years ago and 60 per cent more than at the beginning of World War II 15 years ago.

THE LEADER—The U.S. has more steelmaking capacity than any other nation. It has around 40 per cent of the world's total.

The U.S. capacity to make steel for ingots and castings (128,363,090 net tons on Jan. 1, 1956) is nearing a 132-million-ton level for Jan. 1, 1957. At the start of the Korean War, we had 99,392,800 tons. At the beginning of World War II, we had only 82,839,259 tons.

HAVE-NOTS— In contrast with the wealth of steelmaking capacity in the U.S., the Arab states and Israel have none. The only way they can wage a shooting war is to be supplied by other countries.

A supplier to the Arab bloc has been Russia—the world's second largest steel producer. But its capacity is less than half of that of the U.S. In 1955, Russia made 49.5 million tons of ingots, and it presumably was operating at capacity. If Russia is continuing to increase its production at the rate prevailing over the last seven years, it will turn out around 53.5 million tons of ingots this year—compared with 114.5 million tons in the U.S. where a strike took six weeks out of production this last summer.

POWERFUL— The U.S. steelmaking capacity doesn't necessarily have to go to war to be effective in the international crisis. The vastness of 132 million tons may serve as a deterrent to war.

The disturbed international situation and the strong possibility of price increases on steel are prompting some buyers to take a close look at the adequacy of their steel supplies. Not much can be done about plates, structural shapes and oil country tubular goods. Production of them is already booked up for many months ahead.

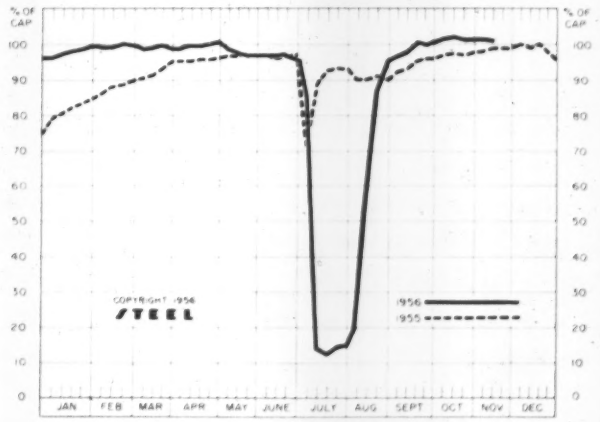
BIG ORDER— Keeping pressure of demand on structural shapes and plates is the construction industry. For example, the structurals for one project are equivalent to 10 per cent of a month's output of the nation's structural mills. The project—an office building for the Chase-Manhattan Bank in New York—requires 47,300 tons of structurals. Bethlehem Steel Co., Bethlehem, Pa., got the order.

HOW'RE INVENTORIES?— Except for several hard-to-get products, steel is in inventories in comfortable amounts. They're neither excessively high nor excessively low. There's about a two-months' supply at current rates of usage. A slight amount of steel inventory accumulation took place in October.

Before the international situation boiled over, buyers of the more plentiful forms of steel were becoming increasingly cautious in their ordering.

ABOVE CAPACITY—There were enough orders on the books to keep steel ingot production above rated capacity for the ninth consecutive week, although a fractional decline occurred. In the week ended Nov. 11, steel for ingots and castings was produced at 101 per cent of capacity, compared with 101.5 a week earlier.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

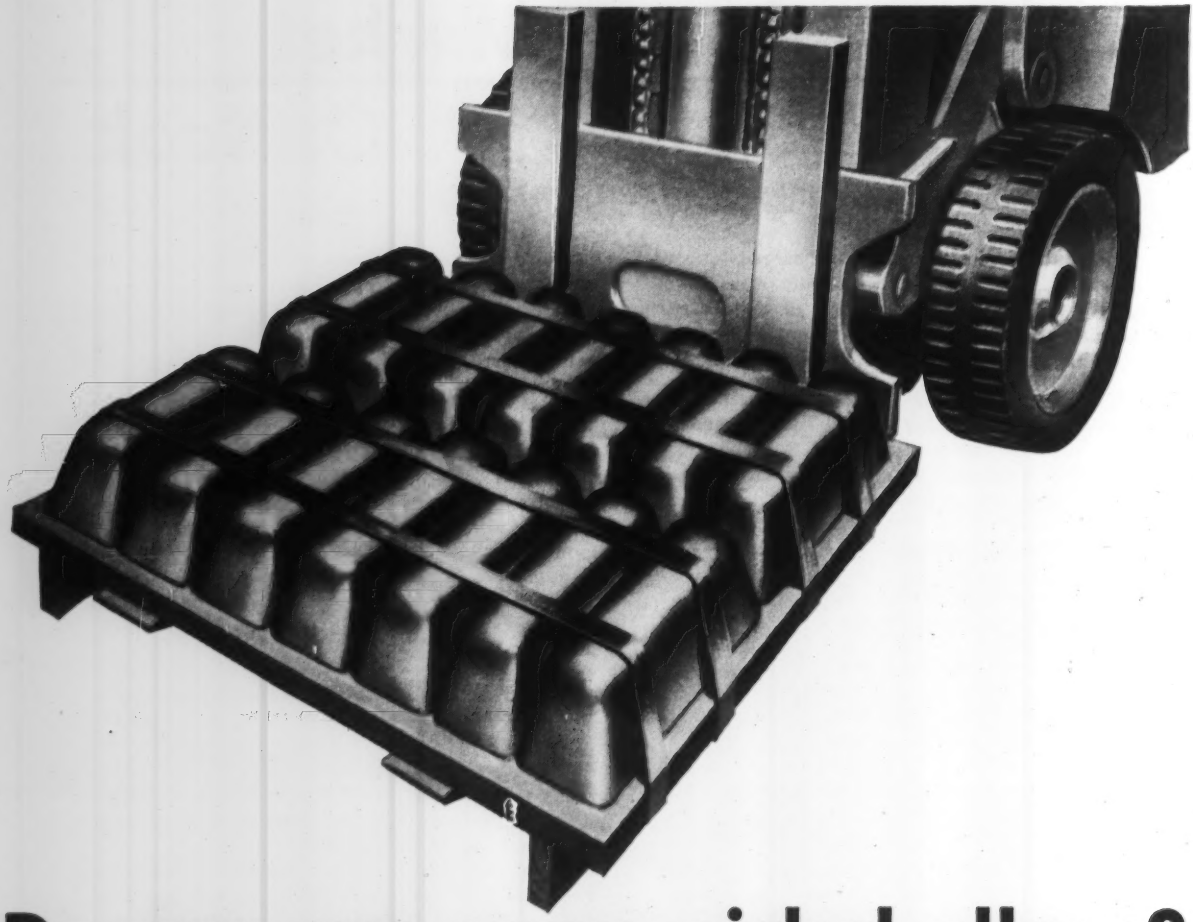
	Week Ended Nov. 11	Change	Same Week 1955	Same Week 1954
Pittsburgh	100.5	0	102	75.5
Chicago	101	— 3*	99	81
Mid-Atlantic	102	0	97.5	70
Youngstown	101	— 1	100	76
Wheeling	101	— 0.5	99	91.5
Cleveland	102	— 3*	100.5	88
Buffalo	107.5	0	105	95.5
Birmingham	95.5	0	94	64
New England	87	0	91	59
Cincinnati	94	+ 9.5	92.5	75
St. Louis	107	+ 2	96.5	87
Detroit	101	+ 1.5	99	80
Western	109	0	100	86
National Rate	101	— 0.5	99	77.5

INGOT PRODUCTION‡

	Week Ended Nov. 11	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	154.1†	155.2	154.6	149.7
NET TONS (In thousands)	2,476†	2,493	2,483	2,404

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,461,893 in 1956; 2,413,278 in 1955; 2,384,549 in 1954.

Metalworking Outlook—p. 73 Technical Outlook—p. 129



Do you use scrap nickel alloys?

Here's a better source of raw material!

ALLOYMET NICKEL BASE pig and shot* are better than scrap nickel alloys in every way — yet they are available to you at only 5% more.

Alloymet pig is easier to store and handle, and melting loss is minimized. Because every heat in each shipment carries a notarized laboratory analysis, you are in effect insured against contamination.

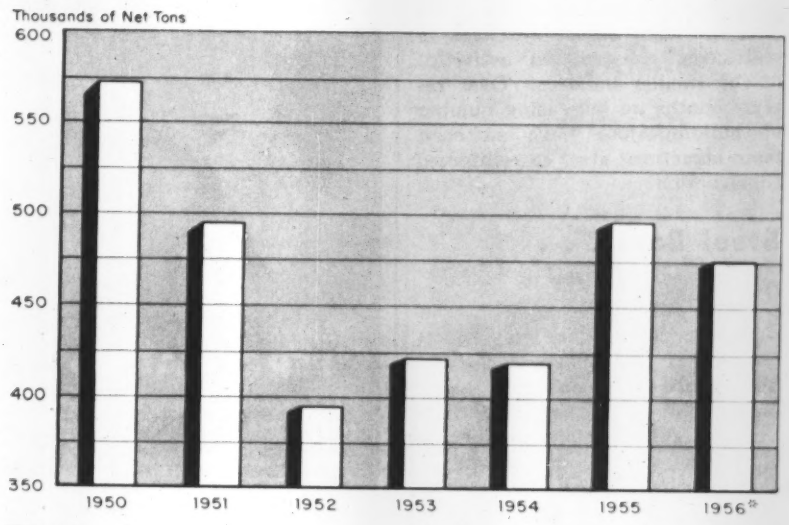
Compare our alloys with scrap in actual use. Discover why its use will more than repay you for the slight premium in cost.

**Alloymet available in a complete range of nickel chrome, nickel iron and nickel copper analyses.*

ALTER COMPANY
ALLOY METAL DIVISION
1701 ROCKINGHAM ROAD
DAVENPORT, IOWA
PHONE 6-2561 • TELETYPE DV 588

World's largest producer of secondary nickel alloys of certified analysis

Rail Bar Shipments: Holding Their Own



*Estimated.
Source: Rail Steel Bar Association.

Rail Steel Men Optimistic

Increasing demand assures producers they will be able to sell all they can produce. Export restrictions may help both supply and price pictures this year

THE SUPPLY of rerolling rails is tight, but that doesn't dampen the optimism of producers of rail steel bars. They are confident that their industry will survive this period of high prices and diminishing supply of raw material.

The chart above indicates that shipments of rail steel bars this year will be slightly above the average for the years shown. The industry's top year was 1948, when it shipped 629,000 tons. The 1956 figure would be higher if more rails were available. O. W. Irwin, president of the Rail Steel Bar Association, says that demand for these high tensile strength bars has about doubled in the last five years. But less replacement of rails by the railroad industry and increased export of good used rails has forced rerollers to substitute new billet steel when possible. Members of the association have operated above 700,000 tons a year for a decade, indicating that from one-half to one-third of their production has been in new steel.

Big Problem—The export situation is the source of most of the industry's current problems. With railroads showing less interest in replacing rails now than they did after World War II, supply of good rerolling rails is short enough, say industry spokesmen. But to allow significant tonnages to move out of the country is like adding insult to injury. During the first nine months of this year, about 60,000 tons went to Mexico, which has waived its import duty on this material for the remainder of the year. (The rails are going primarily to Mexico's construction industry.) That tonnage represented about 15 or 20 per cent of the total rerollers available to the American industry.

This helped put the pinch on our own supplies and forced the price to record high levels. In September, rail steel producers were paying as much as $95 a gross ton in some areas. At this price, it hardly paid rollers to produce rail steel bars, because there is no differential between them and new billet steel bars. The industry went to Washington to present its case and succeeded in getting the Department of Commerce to restrict export licenses for rails starting in September. The limit for the fourth quarter is 1300 tons a month. This eased the price back to the $85-$88 range, which is still too high to make a fair profit on the bars, industry men say. The association is continuing its efforts to get the export restrictions extended into 1957.

Outlook—The future, as the past, depends on how many rails the railroad industry replaces. Two crosscurrents are at work and may cancel each other out. In the first place, studies made by the American Association of Railroads show that diesel engines wear out tracks faster than the steam engines did. One railroad has predicted that it won't be too long until its replacement cycle will be 12 to 15 years, a factor which could increase supply within the next decade. Secondly, some roads are tending to reduce the number of tracks they operate from four tracks to two or two to one. This may cause some immediate increase in supply of good rails, but it would decrease future supply.

Regardless of the supply picture, rail steel producers are pushing their product for greater use in the construction industry. The association is currently promoting a campaign among reinforced concrete designers to design according to "ultimate strength," an area which gives rail steel bars an advantage over new steel bars.

Tensile strength of rerolled bars is about 65,000 psi, compared with about 45,000 psi for new billet bars. Because of this premium in quality, it's a distinct possibility that a premium price may be charged some day for rail steel bars, making them a more profitable item to produce.

SELF TAPPING SELF LOCKING

PHEOLL

SCHWEPPE STUDS

Patents Pending

CUT COSTS

1 ELIMINATE TAPPING

2 HOLD TIGHTER

3 CAN BE 'AUTOMATED'

WHEREVER a stud is specified, you can profitably cut production time and cost with self-tapping, self-locking Schweppe Studs. They also can replace bolts to advantage on many applications.

WHAT ARE SCHWEPPE STUDS?

They are double-ended studs made with dual thread-cutting slots at the lower end. Final threads on this end develop a positive frictional interference locking action on entering the hole.

HOW ARE THEY DRIVEN?

Schweppe Studs can be driven in an inexpensive *drilled* hole with any power stud driver. In one simple, continuous operation, they cut their own thread, drive, lock and seal.

WHAT ARE THEIR ADVANTAGES?

The *self-tapping* feature eliminates tapping time and thread inspection, tap wear and replacement, tap breakage and salvage time. The *self-locking* action of Schweppe Studs prevents loosening or backing out, even under extreme conditions.

WHAT ABOUT AUTOMATION?

Since Schweppe Studs may be located accurately from the slotted end, they can be "hopperized" for automatic feeding and driving.

•To fit many applications, Pheoll Schweppe Studs can be furnished in a broad range of metals, finishes, sizes and thread styles. Learn how you can profit . . . find out about the many advantages . . .

Write for free Bulletin 1056

PHEOLL MANUFACTURING COMPANY

SCREWS • BOLTS • NUTS

5708 Roosevelt Road, Chicago 50, Ill.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 189

Reinforcing bar sellers claim that the tight money situation is restricting construction activities of the smaller builders. Over recent months an increasing number of building jobs have switched from structural steel to reinforced construction.

Steel Bars . . .

Bar Prices, Page 189

There will be at least two weeks' carry-over in hot carbon bars at the end of this quarter. So producers are not concerned about January order books. But there may be a little more tonnage to distribute around the middle of this month at which time the 45-day lead time expires. If automotive specifications fall short of the industry's full allotment, a little tonnage may be available for distribution to other consumers.

Some producers have opened books on tonnage for delivery after the first of the year on a month-to-month basis. Still others have opened for the entire quarter, and they say they have experienced no rush on the part of consumers to specify far ahead. Much depends on the automotive industry, it appears.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 190 & 191

While business in cold-rolled sheets is somewhat better, the main pressure continues for hot rolled. Enameling stock and low silicon sheets are moving at a slightly improved rate, reflecting gains in requirements of the appliance makers.

Among the flat-rolled items in lightest demand is coated sheet. This lag is due to seasonal influences and expanded production facilities.

Some Chicago area mills find it difficult to dispose of cold-rolled seconds and excess primes (tonnage produced above consumers' quotas, or portions of such quotas that have been declined).

Automotive demand for cold rolled, while stronger, continues puzzling. All the fourth quarter tonnage allocated by Chicago mills was taken up, but this was not

DRILLS 7% MORE GRAY IRON VALVE BODIES PER SHIFT

. . . thanks to

FERROCARBO®

Users everywhere report similar experiences. In fact, on 67 machining tests in 11 large machine shops, castings of gray iron treated with FERROCARBO averaged 89.5% greater machinability per tool than untreated castings. These premium castings are finer-grained, denser, stronger, yet they COST YOU NO MORE . . . because your foundryman, using FERROCARBO, makes worthwhile savings in raw material costs.

FOR FREE BOOKLET on FERROCARBO, citing actual case histories of faster machining, with longer tool life, write The Carborundum Company, Dept. S1, Niagara Falls, N.Y. 64-S1

CARBORUNDUM®

there's so much to choose from at Hotel Cleveland!

What's your pleasure? Fabulous roast beef in Cleveland's first specialty restaurant The Rib Room. Dancing to a famous orchestra in the smart Bronze Room. Relaxing over a drink in the stag Men's Bar. You'll find something to suit every taste and mood at Hotel Cleveland.

And you're in the very heart of town, close to business, shopping and theaters . . . directly connected with Union Passenger Terminal.

the case at Pittsburgh, where some additional tonnage is expected to be open to general fabricators because December auto quotas were not fully specified.

Tubular Goods . . .

Tubular Goods Prices, Page 193

Several spectacular sales records in oil country tubular goods are reported, but signs of a decline in ordering are appearing in other tubular products.

Producers report that pressure is subsiding for delivery of specialty tubing. One firm, taking orders for February shipments, says customers are ordering cautiously. Their conservatism is attributed to the uncertain outlook for business, especially in the light of the disturbing news from abroad.

Auto builders are not pressing too hard for mechanical tubing. They appear to be ordering on a monthly basis. Pressure tubing requirements have declined with the end of the building season approaching.

Plates . . .

Plate Prices, Page 189

Longest shipment delays from Chicago mills are in plates and shapes. The average for plates is 2½ to 3 weeks—about 4 weeks if flame cutting is involved.

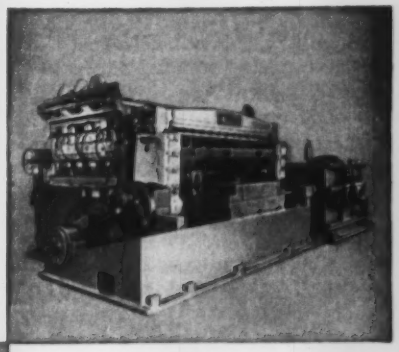
One Chicago mill is engaged in conversion of plates and shapes up to its available capacity and has booked all this business it can handle in the first quarter.

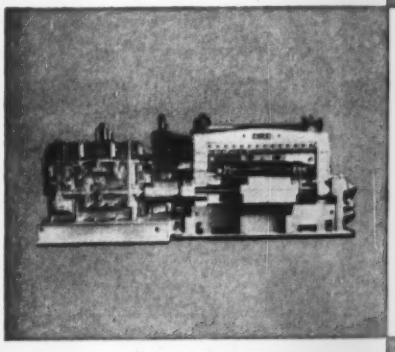
The upheaval in the Middle East serves to further complicate supply prospects in the plate market. Unless the situation is resolved soon ship construction and repair programs will be accelerated sharply.

Plate supply stringency is most severe in the heavy gages and special quality grades. New England fabricators, notably weldment shops, expect no improvement in the situation through the first half of next year. With one leading plate mill scheduled to go down during that period, supply will likely shrink.

Alloy plate demand and order backlogs are heavier, with more rated orders for military and chemical-petroleum requirements. Clad plate deliveries extend 18 weeks, heads 16 weeks.

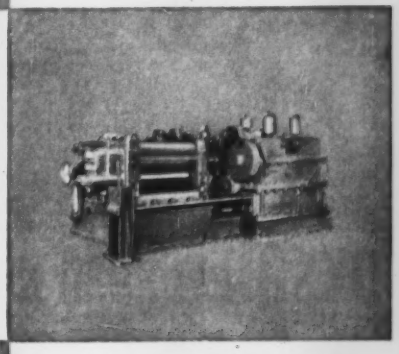
flexible design

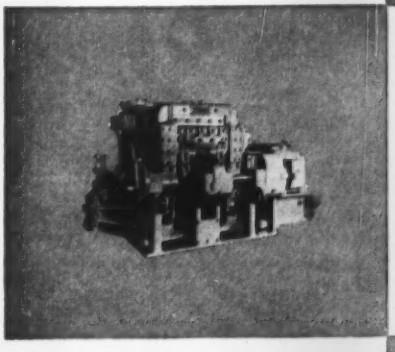




cutting accuracy

continuous feed





rugged construction

Automatic Shears by HALLDEN

"the shearing specialists"
THE HALLDEN MACHINE CO.
THOMASTON, CONNECTICUT

Sales Representatives
The Wean Engineering Co., Inc., Warren, Ohio (Ferrous)
T. E. Dodds, Pittsburgh, Pa. (Non-Ferrous)
W. H. A. Robertson & Co., Ltd., Bedford, England
(Ferrous & Non-Ferrous)

Any definite signs of prolonged and spreading hostilities are bound to be reflected quickly in further supply tightening in plates and other heavy steel products.

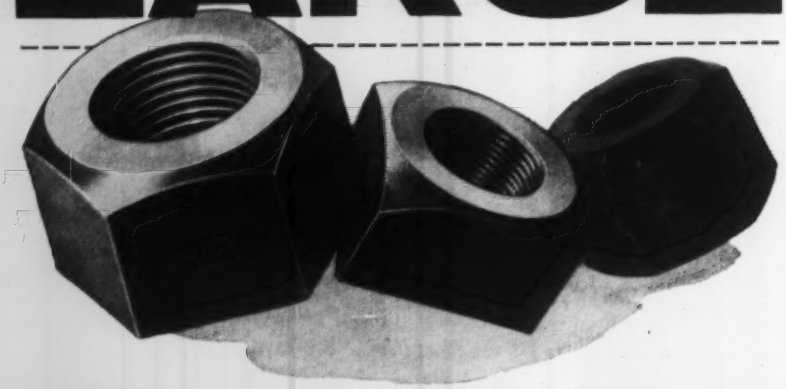
Currently, plate consumers are pressing for first quarter tonnage now that virtually all the mills have opened books for that position. Indications are the producers can book far beyond capacity for the period if they are so disposed. Most of them will have about a month's carry-over at year's end, especially in the heavier gages. Even in the lighter gages arrearages will run at least three weeks.

Freight car demand is featured by the placing of 2400 cars by the Seaboard Air Line.

Pittsburgh area mills are catching up with shipment promises.

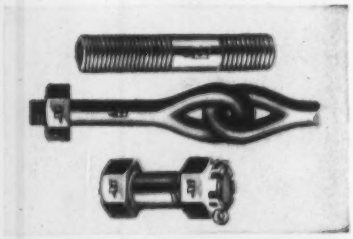
Recently, a shipment of 500 tons of plates and bars from Chile was received at Seattle. In the last nine months, some 12,000 tons of Chilean steel have been landed at Pacific Northwest ports.

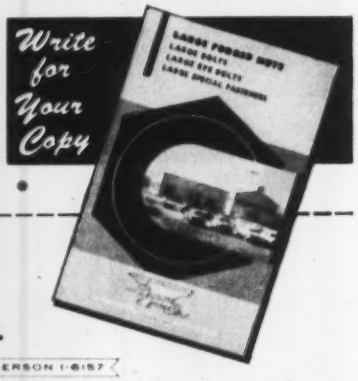
LARGE



DYSON FORGED NUTS • BOLTS • BLANKS

This 36-page large fastener catalog contains complete dimensions, specifications and prices on Dyson large forged nuts. Dyson large nuts, bolts and blanks are forged in a modern plant devoted exclusively to large fasteners. Prompt service on special requirements. Adequate Steel Stocks, machining and heat treating facilities.





JOS. Dyson & Sons Inc.

3126 ST. CLAIR AVE. CLEVELAND 3, OHIO HENDERSON 1-6157

THERE'S NO SUBSTITUTE FOR QUALITY

Warehouse . . .

Warehouse Prices, Page 194

Demand for plates and structural shapes continues heavy as construction firms attempt to fill their needs before the end of the building season.

Many users of other products are consuming large tonnages, but many continue to draw heavily on inventories. They have not resumed purchasing for stock accumulation because the outlook for large potential supplies is good.

Distributors say their stocks are well rounded except in plates and shapes. They can offer quick service on most products. They continue to receive offers of additional tonnages of sheet for December delivery from mills.

Tool Steel . . .

Tool Steel Prices, Page 193

Shipments of high speed and tool steel (excluding hollow drill steel) totaled 9426 net tons in September, reports the American Iron & Steel Institute. This compares with combined July-August shipments of 10,354 tons (low because of the steel strike), and with 9418 tons in September a year ago.

Cumulative shipments through September amounted to 96,515 tons, against 83,042 in the like period last year.

Tin Plate . . .

Tin Plate Prices, Page 191

Tin mills are producing an unusually large proportion of their plate output for prompt shipment. At this season, they usually seek to build up stocks. But some report that so far they have been unable to add much to their own inventories.

Stainless Steel . . .

Stainless Steel Prices, Page 193

Production of stainless and heat resisting steel ingots (exclusive of tool steel) totaled 235,455 net tons in the third quarter, reports the American Iron & Steel Institute. That's 21 per cent less than the 300,957 tons made in the second quarter—the steel strike is largely to blame. In the third quarter last year, output was 288,262 tons. Nine months' production this year amounted to 849,746 tons, com-

pared with 879,183 in the like 1955 period.

Republic Steel Corp., Cleveland, announces a revision in its stainless sheet polishing extras, effective Oct. 29. They are listed in section 3, page 2, of Republic's stainless pricing book.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 195

Metallurgical coke prices are tending upward. In the Philadelphia area, quotations have been marked up $1 a ton to $21, ovens. This follows recent increases in coal prices, and is the first advance on this grade of coke in some time.

Pig Iron . . .

Pig Iron Prices, Page 194

U.S. Steel's National Tube Division's No. 4 blast furnace at the National Works, McKeesport, Pa., has been blown out after setting a record. The stack operated nine years, three months and three days without a shutdown for relining (par is four to five years).

The Canton, O., blast furnace of Republic Steel Corp. was taken out of production for relining Nov. 2.

Consumption of pig iron is holding at a fairly steady pace. But the trend in bookings is seen on the down side during the remainder of the year.

If this downtrend develops, it probably couldn't come at a better time: Bethlehem Steel Co. is withdrawing from the merchant pig iron market permanently by the end of this year. Alan Wood Steel Co. is withdrawing temporarily for about five months while its smaller furnace is undergoing rehabilitation and enlargement.

Supplies of iron have been cut in the South. A strike of 700 blast furnace and transportation workers forced a shutdown of all operations of Woodward Iron Co. on Oct. 31.

Pending withdrawal of the two Pennsylvania producers has focused attention on the possibility of obtaining pig iron from abroad. Prices for foreign iron of dependable grade likely will continue too high to attract buying interest. Dutch and West German iron is quoted around $90, f.o.b. cars, port.

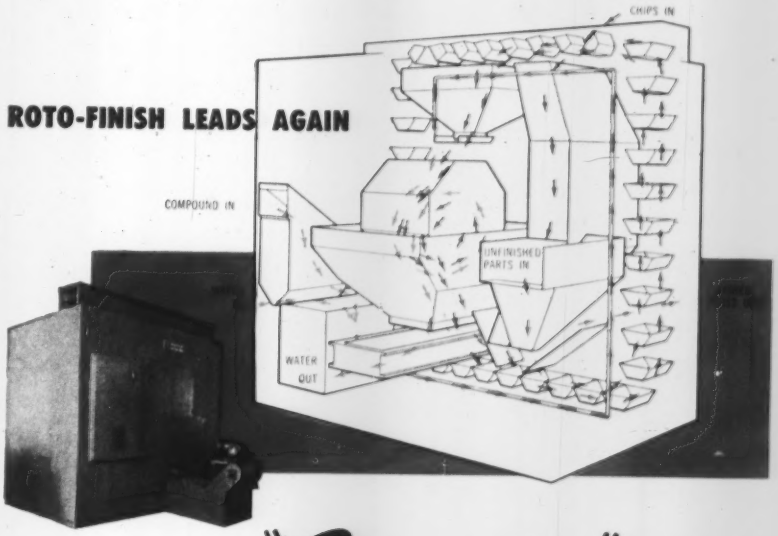
Iron Ore . . .

Iron Ore Prices, Page 195

Inland Steel Co. has received its first shipment of concentrated jasper ore pellets from the Marquette Iron Mining Co. in Michigan's Upper Peninsula. The *E. J. Block* delivered 3300 tons of the pellets Nov. 3. Inland will receive 15,000 tons this month.

October shipments of Lake Superior iron ore totaled 12,628,477 gross tons, down 384,959 tons from the 12,243,518 shipped in October, 1955. Movement to the end of October was reported at 67,251,435 tons, off 12,614,235 tons from the 79,865,670 tons moved in the like period of the 1955 season.

Shipments of lake iron ore in the week ended Nov. 5 totaled 2,807,550 gross tons, according to the Lake Superior Iron Ore Association. This compares with 2,251,222 tons in the like week a year ago. Shipments in the 1956 navigation season to Nov. 5 were



ROTO-FINISH LEADS AGAIN

the new "Rotomation" MACHINE

MAKES MECHANICAL TUMBLING A FULLY AUTOMATIC BARREL FINISHING PROCESS

- Completely Automatic
- Needs no operator in attendance
- Loads and unloads itself with each cycle.
- Cycle variable for different part requirements.
- Provides continuous operation
- Assures uniformity of finish
- Low cost operation — high production
- Complete package unit
- Simple to install . . . Electric, water, air and drain connections only.
- Suitable for straight line production.
- Thus, "Rotomation" barrel finishing machine becomes a machine tool.

Roto-Finish COMPANY

3717 MILHAM ROAD, KALAMAZOO, MICH.

P. O. Box 988 — Phone FI 3-5578

ORIGINATORS OF THE ROTO-FINISH PROCESS

FOREIGN REPRESENTATIVES: CANADA — Toronto — Canadian Hanson & Van Winkle Co., Ltd., Cor. Silver and Morrow Aves. ENGLAND — Mark Road — Hemel Hempstead — Hertfordshire — Roto-Finish Ltd. AUSTRALIA — Cheltenham, 89 Tulip St., A. Flavell Ltd. HOLLAND — BELGIUM — LUXEMBURG — Delft, Holland — N.V. Roto-Finish Maatschappij Rotterdamseweg 370A ● AUSTRIA, GERMANY, SWITZERLAND, NORWAY, SWEDEN Frankfort a.M. — Metallgesellschaft A.G., Germany — Reuterweg 14 ● ITALY — Milan — Societa Roto-Finish a R.L. — Sestos S. Giovanni — Viale E. Marelli 31 ● FRANCE — Paris Societe Roto-Finish, 40-42 rue Chance Milly — Clichy, (Seine) ● BRAZIL — Rio de Janeiro — Commercial E. Industrial de Formos Werco, Ltds. rua General Gurjao, 326 ● SPAIN — Barcelona — Instituto Electroquimico, S.A. — Corcega 59

"One of our important tools in making steel is the Business Press"

says CLIFFORD F. HOOD, President, United States Steel Corporation

"Producing quality steel in quantities to meet today's tremendous needs is a complex technical job. An army of specialists with precision equipment has replaced the old-time melter and roller. It is the *knowledge and ability* of these men and women of specialized skills which has enabled America's steel industry to outproduce the world.

"America's Business Press is just as much a part of their equipment as the modern instruments and mills which produce the steel. With the constant interchange of ideas from their specialized magazines, our people in the steel industry *from top management right down the line* are able to keep abreast of the march of steel progress."

You will find that top men like Mr. Hood, in every industry use business publications as a prime source of information about their own industry and their markets. And they not only read the editorial content, but they also place equal weight on your advertising message – for there, too, they find valuable information.

Write for list of NBP publications – see how you can pin-point your market through the use of these technical, scientific, industrial, merchandising and marketing magazines.

NBP

NATIONAL BUSINESS PUBLICATIONS, INC.

1413 K Street, N. W., Washington 5, D. C. • STerling 3-7535

68,920,842 tons, against 81,210,751 tons in the like period of the 1955 season.

Wire . . .

Wire Prices, Pages 191 & 192

Ingot operations of integrated wire mills in New England and the East are averaging below the national average.

For the most part, shipments of finished wire and incoming orders are about in balance. Deliveries are improving and now approximate normal, with most producers caught up on delinquent tonnage, notably in the carbon grades.

Overtime costs are the exception in wire production. Tempered carbon grade deliveries extend to around eight weeks. A slight improvement in automotive demand is accompanied with some stepping up in pressure for early shipments.

Structural Shapes . . .

Structural Shape Prices, Page 189

Structural steel bookings in September totaled 245,617 tons, down from the August total of 268,273 tons, and off 28 per cent from the 339,461 tons reported for September a year ago, reports the American Institute of Steel Construction. But the nine-month total at 2,978,904 tons was up 11 per cent from the tonnage reported for the like period last year.

Shipments in the month were 240,858 tons, against 213,495 moved in August. They were down 17 per cent from the 289,128 tons shipped in September, 1955, however. The total for the first nine months was 2,344,019 tons, against 2,191,589 in the same period a year ago, up 7 per cent.

Backlogs as of Sept. 30 were 3,107,874 tons, with 1,226,054 scheduled for fabrication through February.

Something of a slight breathing spell is noted in the structural market in New York. Considerable work still is being figured, but extended delivery promises are having a retarding effect.

One of the largest office building awards in the postwar era involves 47,300 tons of structurals for the Chase-Manhattan Bank skyscraper in lower Manhattan. This tonnage went to the Bethlehem Steel Co., which company also is reported to have booked 2700 tons of building bars and piling for the same project.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

47,300 tons, office building, Chase-Manhattan Bank, lower Manhattan, New York, through Turner Construction Co., to Bethlehem Steel Co., Bethlehem, Pa., which company also is understood to have booked 2700 tons of reinforcing bars and piling for the same project.

7500 tons, two 20-story apartments at 25 and 45 Sutton Place, New York, to the Harris Structural Steel Co., New York.

2100 tons, bridge superstructure, Merrimack river, Andover-Methuen, Mass., to the West End Iron Works, Cambridge, Mass., $1,265,000; second low, Phoenix Bridge Co., $1,301,955; Bethlehem Steel Co., $1,346,727.

1975 tons, including some bar joists, tin plate processing plant for the American Can Co., Hammond, Ind., to American Bridge Division, U.S. Steel Corp., Pittsburgh. LaSalle Construction Co., Chicago, is contractor.

300 tons plus, also 125 tons of reinforcing, two Montana state bridges, Yellowstone and Missoula rivers, to unstated interest; general contracts to Holm Construction Co., Glendive, low at $275,872, and N. A. Nelson Construction Co., Sheridan, Wyo., low at $718,051.

300 tons, machinery, valves and miscellaneous, Priest Rapids dam project, to Wyatt & Kipper, Seattle; Merritt, Chapman & Scott, general contractor.

750 tons, office building, Massachusetts Protective Insurance Association, Worcester, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.

300 tons, Public School No. 105, New York, to Bethlehem Fabricators, Bethlehem, Pa.

265 tons, Public School No. 52, New York, to Bethlehem Fabricators, Bethlehem, Pa.

210 tons, 420-ft girder bridge, Missoula, Mont., to Bethlehem Pacific Coast Steel Corp., Seattle, low at $80,502, by county commissioners.

100 tons, state bridge repairs, Wyoming county, Pa., to High-Welding Co., Lancaster, Pa.

STRUCTURAL STEEL PENDING

5400 tons, including trashracks, gates, valves, pipe and penstocks, Trinity dam; notice from Bureau of Reclamation, Weaverville, Calif.; bids to be called late in December.

1580 tons, penstocks, Great Springs power plant, Rouge River Basin project, near Ashland, Oreg.; bids to the Bureau of Reclamation, Denver.

1809 tons, state bridgework, York county, Pa., bids Nov. 30; 1100 tons of reinforcing steel also required, along with a substantial tonnage of steel piling.

750 tons, Du Pont plant, Memphis, Tenn.

540 tons, miscellaneous pipe, grating, spur track, etc., Ice Harbor power project; bids to U.S. Engineer, Walla Walla, Wash., Dec. 18.

530 tons, bridge, Oregon state Williamette river bridge; bids in.

515 tons, one welded girder and two 2-span WF beam composite bridges, Clarendon river, and Otter Creek, Rutland-West Rutland, Vt.

500 tons, YWCA building, Portland, Oreg.; bids Nov. 16.

400 tons, three state bridges, Norwood-Westwood, Mass., Charles Capone Co., Dedham Mass., low on general contract.

240 tons, three-span WF beam composite bridge, Winooski river, Montpelier, Vt.; also 65 tons, reinforcing bars.

195 tons, two state bridges, Mid-Cape highway, Orleans-Brewster, Mass., S. & M. Construction Co., Providence, R. I., low on general contract.

REINFORCING BARS . . .

REINFORCING BARS PLACED

700 tons, municipal garage, Wilmington, Del.,

LEARN WHY

31 metal product manufacturers pay no income tax at all in Puerto Rico

FREE BOOKLET TO MANUFACTURERS

Commonwealth of Puerto Rico, Dept. SM-62
Economic Development Administration
579 Fifth Ave., New York 17, N. Y.

Send me "Facts for the Manufacturer" with information about my particular industry.

Name _____ Title _____

Company _____

Address _____

Product _____

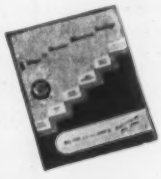
WHEELABRATOR®

STEEL SHOT

cuts abrasive costs up to 23% for Crucible Steel Castings Co.

Wheelabrator Steel Shot proved most economical cleaning steel castings at Crucible Steel Castings Co.! Tests made in a 3-wheel Wheelabrator Monorail Cabinet showed these results: In 322 hours, the 3 wheels consumed over 19,000 lbs. of malleable abrasive, for an abrasive cost averaging $1.578 per wheel hour for each wheel. In 202 hours, the machine used approximately 6,800 lbs. of Wheelabrator Steel Shot for an average abrasive cost of $1.215 per hour for each wheel. This means savings of $.363 per hour for each wheel. The Milwaukee steel foundry operates 10 wheels a total of 100 hours each day, so daily abrasive cost savings add up to approximately $36.30 — or about $8,000 annually. You, too, can save with Wheelabrator Steel Shot, the low-cost answer to cleaning problems.

For additional information on Wheelabrator Steel Shot, send today for Bulletin 89-C.



WHEELABRATOR
CORPORATION
509 S. Byrkit Street, Mishawaka, Indiana

through McClosky & Co., Philadelphia, general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

575 tons, approaches to Maple street, Spokane, Wash. state toll project, to Northwest Steel Rolling Mills Inc., Seattle; general contractor, Henry Hagman, north approach at $763,387; Charles A. Powers, Spokane, south approach, at $300,729.

325 tons, Commerce & Finance Building, Villanova College, Villanova, Pa., through Joseph A. Farrell, general contractor, Philadelphia, to Conrete Steel Co., Philadelphia.

REINFORCING BARS PENDING

16,400 tons, powerhouse foundations, etc., Ice Harbor project; bids to U.S. Engineer, Walla Walla, Wash., Dec. 18; also 6500 lineal ft of steel piling.

6000 tons, Trinity dam, irrigation and power, 2430 ft in length; bids to Bureau of Reclamation, Weaverville, Calif., late December.

5080 tons, steel piling, including 180 tons of bearing piles; bids Nov. 16, Corps of Engineers, Chicago.

300 tons, Washington state box girder bridge, Yakima county; bids to Olympia, Wash., Nov. 20.

120 tons, Washington state projects, Thurston and Spokane counties; general contracts to John P. Hopkins, Mercer Island, low $357,024, and W. G. Meyer & Sons, Spokane, low at $42,290, respectively.

100 tons or more, women's dormitory, University of Portland, Portland, Oreg.; James S. Hickey Inc., low at $409,600.

100 tons or more, dormitory, College of Puget Sound, Tacoma, Wash.; Strom Construction Co., Tacoma, Wash., low at $502,463.

PLATES . . .

PLATES PLACED

350 tons, 24-in. and smaller pipe, Priest Rapids power project, to Wyatt & Kipper, Seattle.

250 tons, also shapes, 375-ft all-welded steel railway car ferry to Albina Engine & Machine Works, Portland, Oreg., for the Western Pacific railway, San Francisco.

PLATES PENDING

750 tons, 13,000-ft 36-in. pipe, if steel; bids to Bureau of Reclamation, Bridgeport, Wash., Nov. 15.

350 tons, 50,000-gal capacity, gasoline storage tanks, Albrook Air Field, Canal Zone; bids Dec. 12.

220 tons, 12 to 18-in. water supply line, bids to A. P. Ballard, secretary, Alderwood Manor, Wash., Nov. 13.

200 tons, 6000 ft, 24 in., and alternatives for concrete cylinder; bids to Lewiston, Idaho, Nov. 19.

120 tons, also concrete cylinder, Cedar river pipe replacement; bids to Seattle, Nov. 14.

PIPE . . .

CAST IRON PIPE PENDING

125 tons, 1420 ft of 20 in., Cedar river project; bids to Seattle, Nov. 14.

100 tons plus, Snohomish County District No. 9, 4 and 6 in., also accessories; bids to Silver Lake, Wash., Nov. 12.

80 tons, also 250 tons steel pipe, Ice Harbor power project; bids to U.S. Engineer, Walla Walla, Wash., Dec. 18.

RAILS, CARS . . .

LOCOMOTIVES PENDING

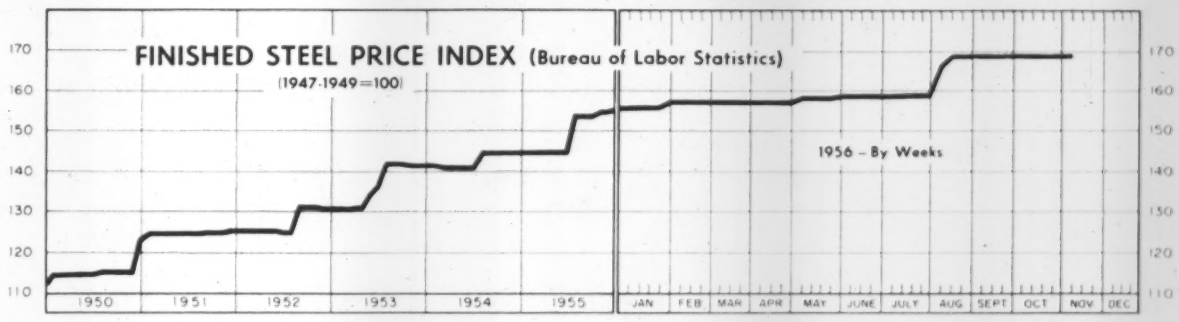
Pennsylvania, fifty 1750 hp diesel-electric freight units; purchase authorized.

RAILROAD CARS PLACED

Northern Pacific, 100 stock cars and the rebuilding of an additional 100, to the road's own shops at Brainerd, Minn.

Seaboard Air Line, 2400 cars, with 700 seventy-ton coal hoppers going to the Pullman-Standard Car Mfg. Co., Chicago; 700 fifty-ton low-side gondolas to the Bethlehem Steel Co., Johnstown, Pa.; 500 covered cement cars to the Berwick, Pa. plant of the ACF Industries Inc.; 300 pulpwood cars to the Greenville Steel Car Co., Greenville, Pa.; and 200 seventy-ton high-side gondolas to the Clifton, N. J. plant of the Magor Car Corp.

Price Indexes and Composites



Nov. 6 1956	Week Ago	Month Ago	Oct. Avg.	Year Ago
168.8	168.6	168.6	168.6	154.5

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Nov. 6

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard, No. 1	$5.150
Rails, Light, 40 lb	6.567
Tie Plates	6.025
Axles, Railway	8.950
Wheels, Freight Car, 33 in. (per wheel)	57.50
Plates, Carbon	5.550
Structural Shapes	5.267
Bars, Tool Steel, Carbon (lb)	0.480
Bars, Tool Steel Alloy, Oil Hardening Die (lb)	0.585
Bars, Tool Steel, H. R. Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.274
Bars, Tool Steel, H.R., Alloy, High Speed W18 Cr 4, V 1 (lb)	1.769
Bars, H.R., Alloy	10.025
Bars, H.R., Stainless, 303 (lb)	0.483
Bars, H.R., Carbon	5.925
Bars, Reinforcing	5.738
Bars, C.F., Carbon	9.610
Bars, C.F., Alloy	13.275
Bars, C.F., Stainless, 302 (lb)	0.508
Sheets, H.R., Carbon	5.695
Sheets, C.R., Carbon	6.639
Sheets, Galvanized	8.220
Sheets, C.R., Stainless, 302 (lb)	0.635
Sheets, Electrical	11.225
Strip, C.R., Carbon	8.543
Strip, C.R., Stainless, 403 (lb)	0.475
Strip, H.R., Carbon	5.900
Pipe, Black, Buttweld (100 ft)	18.376
Pipe, Galv., Buttweld (100 ft)	22.516
Pipe, Line (100 ft)	182.860
Casing, Oil Well, Carbon (100 ft)	178.046
Casing, Oil Well, Alloy (100 ft)	276.870
Tubes, Boiler (100 ft)	45.033
Tubing, Mechanical, Carbon (100 ft)	22.973
Tubing, Mechanical, Stainless, 304 (100 ft)	187.133
Tin Plate, Hot-dipped, 1.25 lb.	9.433
Tin Plate, Electrolytic, 0.25 lb	8.133
Black Plate, Canmaking Quality	7.233
Wire, Drawn, Carbon	9.175
Wire, Drawn, Stainless, 430 (lb)	0.630
Bale ties (bundle)	7.213
Nails, Wire, 8d Common	9.368
Wire, Barbed (80-rod spool)	8.412
Woven Wire Fence (20-rod roll)	20.505

STEEL's FINISHED STEEL PRICE INDEX*

	Nov. 7 1956	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	225.58	225.58	225.58	208.90	171.92
Index in cents per lb	6.111	6.111	6.111	5.659	4.657

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel NT*	$137.48	$137.48	$137.48	$128.14	$106.32
No. 2 Fdry Pig Iron, GT	62.63	62.63	62.63	58.99	52.54
Basic Pig Iron, GT	62.18	62.18	62.18	58.49	52.16
Malleable Pig Iron, GT	63.41	63.41	63.41	59.77	53.27
Steelmaking Scrap, GT	59.17	58.67	57.00	45.33	43.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	Nov. 7 1956	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	5.075	5.075	5.075	4.65	3.70
Bars, H.R., Chicago	5.075	5.075	5.075	4.65	3.70
Bars, H.R., deld., Philadelphia	5.35	5.35	5.35	4.90	4.223
Bars, C.F., Pittsburgh	6.85*	6.85*	6.85*	5.90	4.55
Shapes, Std., Pittsburgh	5.00	5.00	5.00	4.60	3.65
Shapes, Std., Chicago	5.00	5.00	5.00	4.60	3.65
Shapes, deld., Philadelphia	5.40	5.40	5.40	4.88	3.918
Plates, Pittsburgh	4.85	4.85	4.85	4.50	3.70
Plates, Chicago	4.85	4.85	4.85	4.50	3.70
Plates, Coatesville, Pa.	5.25	5.25	5.25	4.80	4.15
Plates, Sparrows Point, Md.	4.85	4.85	4.85	4.50	3.70
Plates, Claymont, Del.	5.35	5.35	5.35	4.80	4.15
Sheets, H.R., Pittsburgh	4.675	4.675	4.675	4.325	3.60-3.75
Sheets, H.R., Chicago	4.675	4.675	4.675	4.325	3.60
Sheets, C.R., Pittsburgh	5.75	5.75	5.75	5.325	4.35
Sheets, C.R., Chicago	5.75	5.75	5.75	5.325	4.35
Sheets, C.R., Detroit	5.75-5.85	5.75-5.85	5.75-5.85	5.325-5.425	4.55
Sheets, Galv., Pittsburgh	6.30	6.30	6.30	5.85	4.80
Strip, H.R., Pittsburgh	4.675	4.675	4.675	4.325	3.75-4.00
Strip, H.R., Chicago	4.675	4.675	4.675	4.325	3.50
Strip, C.R., Pittsburgh	6.85	6.85	6.85	6.25	4.65-5.35
Strip, C.R., Chicago	6.85	6.85	6.85	6.35	4.90
Strip, C.R., Detroit	6.95	6.95	6.95	6.35	4.85-5.60
Wire, Basic, Pittsburgh	7.20	7.20	7.20	6.25	4.85-5.10
Nails, Wire, Pittsburgh	8.20	8.20	8.20	7.60	5.90-6.20
Tin plate (1.50 lb).box.Pitts.	$9.85	$9.85	$9.85	$9.45	$8.70

*Including 0.35c for special quality

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$91.50	$91.50	$91.50	$84.50	$66.00
Wire rods, 7/32-½" Pitts.	5.80	5.80	5.80	5.025	4.10-4.30

PIG IRON, Gross Ton

	Nov. 7 1956	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$63.50	$63.50	$63.50	$59.50	$53.00
Basic, Valley	62.50	62.50	62.50	58.50	52.00
Basic, deld. Phila.	66.26	66.26	66.26	62.16	56.61
No. 2 Fdry, Neville Island, Pa.	63.00	63.00	63.00	59.00	52.50
No. 2 Fdry, Chicago	63.00	63.00	63.00	59.00	52.50
No. 2 Fdry, deld. Phila.	66.76	66.76	66.76	62.66	57.11
No. 2 Fdry, Birm.	59.00	59.00	59.00	55.00	48.88
No. 2 Fdry (Birm.) deld. Cin.	66.70	66.70	66.70	62.70	55.49
Malleable, Valley	63.00	63.00	63.00	59.00	52.50
Malleable, Chicago	63.00	63.00	63.00	59.00	52.50
Ferromanganese, Duquesne	235.00†	235.00†	235.00†	190.00†	188.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

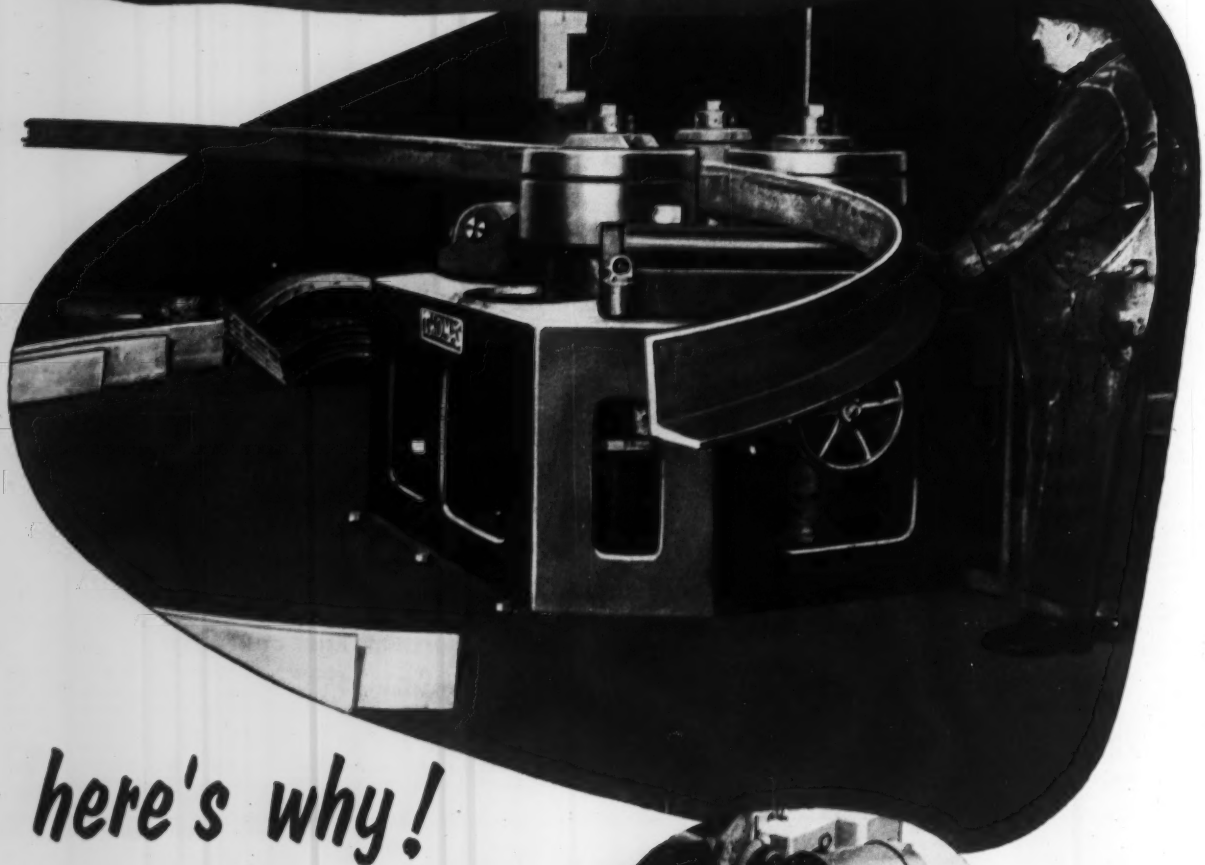
SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$58.50	$57.50	$56.60	$44.50	$44.00
No. 1 Heavy Melt, E. Pa.	58.00	57.50	56.50	47.00	42.50
No. 1 Heavy Melt, Chicago	61.00	61.00	58.00	44.50	42.50
No. 1 Heavy Melt, Valley	66.50	66.50	64.50	48.00	44.00
No. 1 Heavy Melt, Cleve.	65.00	65.00	63.00	45.50	43.00
No. 1 Heavy Melt, Buffalo	57.50	57.50	57.50	43.50	43.00
Rails, Rerolling, Chicago	87.50	87.50	83.00	65.50	52.50
No. 1 Cast, Chicago	50.50	50.50	50.50	47.50	49.00

COKE, Net Ton

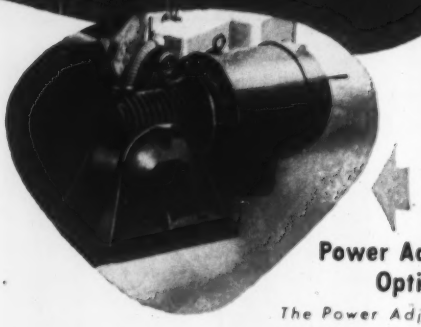
Beehive, Furn, Connisvl.	$14.50	$14.50	$14.50	$13.625	$14.75
Beehive, Fdry, Connisvl.	17.50	17.50	17.50	16.50	17.50

the trend is to THOMAS... for ANGLE BENDERS too!



here's why!

1. *All-steel* welded construction . . maximum strength with minimum floor-space required.
2. Furnished complete for leg-out or leg-in angle bending . . *no extras to buy!*
3. Quick roll adjustment for width of slot . . quicker change-over.
4. Special roll combinations available for beams, channels, flats, pipe, etc.
5. Usual Thomas ruggedness and dependability, as found in all Thomas metal-working machinery.



Power Adjustment Optional

The Power Adjustment of the Movable Roll Shaft is an optional extra. It is used for quickly changing roll centers for different diameters. Machines also may be equipped with Electric Brake on the main driving motor for greater accuracy of bending.

Bulletin 314-A contains complete specifications and capacities covering the four sizes and two styles. Write.

PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES

THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA. 38

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers page 190; to footnotes, page 192.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$70.50

INGOTS, Alloy (NT)
Detroit R7 .....$74.00
Houston 85 .....74.00
Midland,Pa. C18 .....74.00
Munhall,Pa. U5 .....74.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Aliquippa,Pa. J5 ....$74.00
Bessemer,Pa. U5 .....74.00
Bridgeport,Conn. N19..79.00
Buffalo R2 .....74.00
Clairton,Pa. U5 .....74.00
Ensley,Ala. T2 .....74.00
Fairfield,Ala. T2 .....74.00
Fontana,Calif. K1 .....83.50
Gary,Ind. U5 .....74.00
Johnstown,Pa. B2 .....74.00
Lackawanna,N.Y. B2..74.00
LoneStar,Tex. L6 .....80.00
Munhall,Pa. U5 .....74.00
Pittsburgh J5 .....74.00
S.Chicago,Ill. R2, U5..74.00
S.Duquesne,Pa. U5 ....74.00
Sterling,Ill. N15 .....74.00
Youngstown R2 .....74.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$91.50
Bessemer,Pa. U5 .....91.50
Bridgeport,Conn. N19 ..96.50
Buffalo R2 .....91.50
Canton,O. R2 .....94.00
Clairton,Pa. U5 .....91.50
Conshohocken,Pa. A3 ..96.50
Ensley,Ala. T2 .....91.50
Fairfield,Ala. T2 .....91.50
Fontana,Calif. K1....101.00
Gary,Ind. U5 .....91.50
Geneva,Utah C11 ....91.50
Houston 85 .....96.50
Johnstown,Pa. B2 ....91.50
Lackawanna,N.Y. B2..91.50
LosAngeles B3 .....101.00
Midland,Pa. C18 .....91.50
Munhall,Pa. U5 .....91.50
Pittsburgh J5 .....91.50
Seattle B3 .....105.00
S.Chicago R2, U5, W14 91.50
S.Duquesne,Pa. U5 ....91.50
S.SanFrancisco B3 ...101.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$107.00
Bridgeport,Conn. N19 .107.00
Buffalo R2 .....107.00
Canton,O. R2 .....107.00
Conshohocken,Pa. A3 .114.00
Detroit R7 .....107.00
Fontana,Calif. K1 ....128.00
Gary,Ind. U5 .....107.00
Houston 85 .....112.00
Ind.Harbor,Ind. Y1 ..107.00
Johnstown,Pa. B2 ....107.00
Lackawanna,N.Y. B2 .107.00
LosAngeles B3 .....127.00
Massillon,O. R2 .....107.00
Midland,Pa. C18 .....107.00
Munhall,Pa. U5 .....107.00
S.Chicago R2,U5,W14 .107.00
S.Duquesne,Pa. U5 ..107.00
Struthers,O. Y1 .....107.00
Warren,O. C17 .....107.00

ROUNDS, SEAMLESS TUBE (NT)
Bridgeport,Conn. N19 $116.50
Buffalo R2 .....111.50
Canton,O. R2 .....114.00
Cleveland R2 .....111.50
Gary,Ind. U5 .....111.50
S.Chicago,Ill. R2, W14 111.50
S.Duquesne,Pa. U5 ..111.50

SKELP
Aliquippa,Pa. J5 ....4.725
LoneStar,Tex. L6 ....5.025
Munhall,Pa. U5 .....4.625
SparrowsPoint,Md. B2 .4.625
Warren,O. R2 .....4.625
Youngstown R2, U5 ..4.625

WIRE RODS
AlabamaCity,Ala. R2 ..5.80
Aliquippa,Pa. J5 .....5.80
Alton,Ill. L1 .....6.00
Buffalo W12 .....5.80
Cleveland A7 .....5.80
Donora,Pa. A7 .....5.80
Fairfield,Ala. T2 .....5.80
Houston 85 .....6.05
IndianaHarbor,Ind. Y1 .5.80
Johnstown,Pa. B2 .....5.80
Joliet,Ill. A7 .....5.80
KansasCity,Mo. 85 ....6.05
Kokomo,Ind. C16 .....5.90
LosAngeles B3 .....6.60
Minnequa,Colo. C10 ...6.05
Monessen,Pa. P7 .....5.80
N.Tonawanda,N.Y. B11.5.80
Pittsburg,Calif. C11 ....6.45
Portsmouth,O. P12 ....5.80
Roebling,N.J. R5 .....5.90
S.Chicago,Ill. R2 .....5.80
SparrowsPoint,Md. B2..5.90
Sterling,Ill.(1) N15 ....5.80
Sterling,Ill. N15 .....5.90
Struthers,O. Y1 .....5.80
Worcester,Mass. A7 ....6.10

STRUCTURALS

Carbon Steel Std. Shapes
Ala.City,Ala. R2 .....5.00
Aliquippa,Pa. J5 .....5.00
Bessemer,Ala. T2 .....5.00
Bethlehem,Pa. B2 .....5.05
Birmingham C15 .....5.30
Clairton,Pa. U5 .....5.00
Fairfield,Ala. T2 .....5.00
Fontana,Calif. K1 .....5.70
Gary,Ind. U5 .....5.00
Geneva,Utah C11 .....5.00
Houston 85 .....5.10
Ind Harbor,Ind. I-2 ....5.00
Johnstown,Pa. B2 ....5.05
KansasCity,Mo. 85 ....5.10
Lackawanna,N.Y. B2 ...5.05
LosAngeles B3 .....5.70
Minnequa,Colo. C10 ....5.30
Munhall,Pa. U5 .....5.00
Niles,Calif. P1 .....5.75
Phoenixville,Pa. P4 ....5.85
Portland,Oreg. O4 .....5.80
Seattle B3 .....5.75
S.Chicago,Ill. U5, W14 ..5.00
S.SanFrancisco B3 ....5.65
Sterling,Ill. N15 .....5.00
Torrance,Calif. C11 ....5.70
Weirton,W.Va. W6 ....5.00

Wide Flange
Bethlehem,Pa. B2 .....5.05
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....5.85
IndianaHarbor,Ind. I-2..5.00
Lackawanna,N.Y. B2 ..5.05
Munhall,Pa. U5 .....5.00
Phoenixville,Pa. P4 ....5.85
S.Chicago,Ill. U5 .....5.00

Alloy Std. Shapes
Clairton,Pa. U5 .....6.20
Gary,Ind. U5 .....6.20
Houston 85 .....6.30
Munhall,Pa. U5 .....6.20
S.Chicago,Ill. U5 .....6.20

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 .....7.35
Bessemer,Ala. T2 .....7.35
Bethlehem,Pa. B2 .....7.40
Clairton,Pa. U5 .....7.35
Fairfield,Ala. T2 .....7.35
Fontana,Calif. K1 ....8.05
Gary,Ind. U5 .....7.35
Geneva,Utah C11 .....7.35
Houston 85 .....7.45
Ind.Harbor,Ind. I-2, Y1 7.35
Johnstown,Pa. B2 ....7.40
KansasCity,Mo. 85 ....7.45
Lackawanna,N.Y. B2 ..7.40
LosAngeles B3 .....8.05
Munhall,Pa. U5 .....7.35
Seattle B3 .....8.10
S.Chicago,Ill. U5, W14..7.35
S.SanFrancisco B3 ....8.00
Struthers,O. Y1 .....7.35

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....7.40
Ind.Harbor,Ind. I-2 ...7.35
Lackawanna,N.Y. B2 ..7.40
Munhall,Pa. U5 .....7.35
S.Chicago,Ill. U5 .....7.35

PILING

BEARING PILES
Bethlehem,Pa. B2 .....5.05
Lackawanna,N.Y. B2 ..5.05
Munhall,Pa. U5 .....5.00
S.Chicago,Ill. U5 .....5.00

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ...5.90
Lackawanna,N.Y. B2 ..5.90
Munhall,Pa. U5 .....5.90
S.Chicago,Ill. U5 .....5.90

PLATES

PLATES, Carbon Steel
Ala.City,Ala. R2 .....4.85
Aliquippa,Pa. J5 .....4.85
Ashland,Ky. (15) A10..4.85
Bessemer,Ala. T2 .....4.85
Bridgeport,Conn. N19 ..4.75
Clairton,Pa. U5 .....4.85
Claymont,Del. C22 ....5.35
Cleveland J5, R2 .....4.95
Coatesville,Pa L7 ....5.25
Conshohocken,Pa. A3 ..4.90
Detroit M1 .....4.95
Ecorse,Mich. G5 .....4.95
Fairfield,Ala. T2 .....4.85
Fontana,Calif.(30) K1 .5.55
Gary,Ind. U5 .....4.85
Geneva,Utah C11 .....4.85
GraniteCity,Ill. G4 ....5.05
Harrisburg,Pa. P4 ....5.80
Houston 85 .....4.95
Ind.Harbor,Ind. I-2, Y1..4.85
Johnstown,Pa. B2 .....4.85
Lackawanna,N.Y. B2 ..4.85
LoneStar,Tex. L6 .....5.20
Minnequa,Colo. C10 ....5.70
Munhall,Pa. U5 .....4.85
Newport,Ky. N9 .....4.85
Pittsburgh J5 .....4.85
Riverdale,Ill. A1 .....4.85
Seattle B3 .....5.75
Sharon,Pa. S3 .....4.85
S.Chicago,Ill. U5, W14 ..4.85
SparrowsPoint,Md. B2 ..4.85
Steubenville,O. W10 ....4.85
Warren,O. R2 .....4.85
Weirton,W.Va. W6 ....4.85
Youngstown R2, U5, Y1 4.85

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ....6.20
Fontana,Calif. K1 .....6.70
Geneva,Utah C11 .....6.00
Johnstown,Pa. B2 .....5.65
SparrowsPoint,Md. B2 ..5.65

PLATES, Wrought Iron
Economy,Pa. B14 ....11.128

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....7.25
Bessemer,Ala. T2 .....7.25
Clairton,Pa. U5 .....7.25
Claymont,Del. C22 ....7.55
Cleveland J5, R2 .....7.25
Coatesville,Pa. L7 .....7.55
Conshohocken,Pa. A3 ..7.25
Ecorse,Mich. G5 .....7.35
Fairfield,Ala. T2 .....7.25
Fontana,Calif.(30) K1 ..7.95
Gary,Ind. U5 .....7.25
Geneva,Utah C11 .....7.25
Houston 85 .....7.35
Ind.Harbor,Ind. I-2, Y1 7.25
Johnstown,Pa. B2 .....7.25
Munhall,Pa. U5 .....7.25
Pittsburgh J5 .....7.25
Seattle B3 .....8.15
Sharon,Pa. S3 .....7.25
S.Chicago,Ill. U5, W14 ..7.25
SparrowsPoint,Md. B2 ..7.25
Warren,O. R2 .....7.25
Youngstown U5, Y1 ....7.25

PLATES, Alloy
Bridgeport,Conn. N19 ..6.55
Claymont,Del. C22 ....6.85
Coatesville,Pa. L7 ....6.85
Fontana,Calif.(30) K1 ...7.55
Gary,Ind. U5 .....6.85
Houston 85 .....6.95
Ind.Harbor,Ind. Y1 ....6.85
Johnstown,Pa. B2 .....6.85
Munhall,Pa. U5 .....6.85
Newport,Ky. N9 .....6.85
Seattle B3 .....7.75
Sharon,Pa. S3 .....6.85
S.Chicago,Ill. U5, W14 ..6.85
SparrowsPoint,Md. B2 ..6.85
Youngstown Y1 .....6.85

FLOOR PLATES
Cleveland J5 .....5.925
Conshohocken,Pa. A3 ..5.925
Harrisburg,Pa. P4 ....6.275
Ind.Harbor,Ind. I-2 ...5.925
Munhall,Pa. U5 .....5.925
S.Chicago,Ill. U5 .....5.925

PLATES, Ingot Iron
Ashland c.l. (15) A10 ..5.10
Ashland l.c.l. (15) A10..5.60
Cleveland c.l. R2 .....5.60
Warren,O. c.l. R2 .....5.60

BARS

BARS, Hot-Rolled Carbon
(Merchant Quality)
Ala.City,Ala.(9) R2 ..5.075
Aliquippa,Pa.(9) J5 ..5.075
Alton,Ill. L1 .....5.275
Atlanta(9) A11 .....5.075
Bessemer,Ala.(9) T2 ..5.075
Birmingham(9) C15 ...5.375
Bridgeport,Conn. N19 ..5.30
Buffalo(9) R2 .....5.075
Clairton,Pa. U5 .....5.075
Cleveland(9) R2 .....5.075
Ecorse,Mich.(9) G5 ...5.175
Emeryville,Calif. J7 ....5.85
Fairfield,Ala.(9) T2 ..5.075
Fairless,Pa.(9) U5 ...5.225
Fontana,Calif.(9) K1 ..5.775
Gary,Ind.(9) U5 .....5.075
Geneva,Utah(9) C11 ..5.157
Houston(9) 85 .....5.325
Ind.Harbor(9) I-2, Y1 ..5.075
Johnstown,Pa.(9) B2 ..5.075
Joliet,Ill. P22 .....5.575
KansasCity,Mo.(9) 85 .5.325
Lackawanna(9) B2 ....5.075
LosAngeles(9) B3 .....5.775
Milton,Pa.(23) M18 ...5.425
Minnequa,Colo. C10 ...5.525
Niles,Calif. P1 .....5.85
N.Tonawanda,N.Y.(9)R11 5.075
Pittsburg,Calif.(9) C11 5.775
Pittsburgh(9) J5 .....5.075
Portland,Oreg. O4 .....5.85
Seattle B3, N14 .....5.825
S.Ch'c'go(9) R2,U5,W14 5.075
S.Duquesne,Pa.(9) U5 5.075
S.SanFran.,Calif.(9) B3 5.825
Sterling,Ill.(1) N15 ..5.075
Sterling,Ill. N15 .....5.175
Struthers,O. Y1 .....5.075
Torrance,Calif.(9) C11 5.775
Weirton,W.Va.(9)W6 ..5.075
Youngstown(9) R2, U5 5.075

BARS, H.R. Leaded Alloy
(Including leaded extra)
Warren,O. C17 .....7.125

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....6.125
Bridgeport,Conn. N19 ..6.20
Buffalo R2 .....6.125
Canton,O. R2 .....6.125
Clairton,Pa. U5 .....6.125
Detroit R7 .....6.125
Ecorse,Mich. G5 .....6.225
Fairless,Pa. U5 .....6.275
Fontana,Calif. K1 ....7.175
Gary,Ind. U5 .....6.125
Houston 85 .....6.375
Ind.Harbor,Ind. I-2,Y1 6.125
Johnstown,Pa. B2 ....6.125
KansasCity,Mo. 85 ....6.375
Lackawanna,N.Y. B2 ..6.125
LosAngeles B3 .....7.175
Massillon,O. R2 .....6.125
Midland,Pa. C18 .....6.125
S.Chicago R2, U5, W14 6.125
S.Duquesne,Pa. U5 ....6.125
Struthers,O. Y1 .....6.125
Warren,O. C17 .....6.125
Youngstown U5 .....6.125

BARS & SMALL SHAPES, H.R.
High-Strength Low-Alloy
Aliquippa,Pa. J5 ....7.425
Bessemer,Ala. T2 ....7.425
Bethlehem,Pa. B2 ....7.425
Bridgeport,Conn. N19 ..7.50
Clairton,Pa. U5 .....7.425
Cleveland R2 .....7.525
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.425
Fontana,Calif. K1 ....8.125
Gary,Ind. U5 .....7.425
Houston 85 .....7.675
Ind.Harbor,Ind. Y1 ....7.425
Johnstown,Pa. B2 .....7.425
KansasCity,Mo. 85 ....7.675
Lackawanna,N.Y. B2 ..7.425
LosAngeles B3 .....8.125
Pittsburgh J5 .....7.425
Seattle B3 .....8.175
S.Chicago,Ill. U5, W14 7.425
S.Duquesne,Pa. U5 ....7.425
S.SanFrancisco B3 ....8.175
Struthers,O. Y1 .....7.425
Youngstown U5 .....7.425

BAR SIZE ANGLES, H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.225
Houston 85 .....5.325
KansasCity,Mo. 5.325
Lackawanna(9) B2 ....5.075
Sterling,Ill. N15 .....5.175
Sterling,Ill(1) N15 ...5.075

BAR SIZE ANGLES, S. Shapes
Aliquippa,Pa. J5 ....5.075
Atlanta A11 .....5.575
Joliet,Ill. P22 .....5.10
Niles,Calif. P1 .....5.85
Pittsburgh J5 .....5.075
Portland,Oreg. O4 .....5.85
SanFrancisco B7 .....5.95

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....6.20
Gary,Ind. U5 .....6.20
Houston 85 .....6.45
KansasCity,Mo. 85 ....6.45
Youngstown U5 .....6.20

BARS, C.F. Loaded Alloy
(Including loaded extra)
Ambridge,Pa. W18 .....9.475
BeaverFalls,Pa. M12 .....9.475
Chicago W18 .....9.475
Cleveland C20 .....9.475
LosAngeles S30 .....11.10
LosAngeles P2 .....11.00
Monaca,Pa. S17 .....9.225
Newark,N.J. W18 .....9.65
Warren,O. C17 .....9.475

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....6.85
BeaverFalls,Pa. M12,R2 6.85
Bridgeport,Conn. N19 ..7.20
Buffalo B5 .....6.90
Camden,N.J. P13 .....7.30
Carnegie,Pa. C12 .....6.85
Chicago W18 .....6.85
Cleveland A7, C20 ....6.85
Detroit B5, P17 .....7.00
Detroit R7 .....6.85
Donora,Pa. A7 .....6.85
Elyria,O. W8 .....6.85
FranklinPark,Ill. N5 ....6.85
Gary,Ind. U5 .....6.85
GreenBay,Wis. F7 .....6.85
Hammond,Ind. L2, M13 6.85
Hartford,Conn. R2 ....7.35
Harvey,Ill. B5 .....6.85
LosAngeles(49) S30 ....8.30
LosAngeles P2, R2 ....8.30
Mansfield,Mass. B5 ....7.40
Massillon,O. R2, R8 ..6.85
Midland,Pa. C18 .....6.85
Monaca,Pa. S17 .....6.85
Newark,N.J. W18 .....7.30
NewCastle,Pa.(17) B4 ..6.85
Pittsburg J5 .....6.85
Plymouth,Mich. P5 ....7.10
Putnam,Conn. W18 ....7.40
Readville,Mass. C14 ....7.40
S.Chicago,Ill. W14 ....6.85
SpringCity,Pa. K3 .....7.30
Struthers,O. Y1 .....6.85
Waukegan,Ill. A7 .....6.85
Youngstown F3, Y1 ....6.85

BARS, Cold-Finished Carbon
(Turned and Ground)
Cumberland,Md.(5) C19..8.10

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....8.325
BeaverFalls,Pa. M12,R2 8.325
Bethlehem,Pa. B2 .....8.325
Bridgeport,Conn. N19 ..8.475
Buffalo B5 .....8.325
Camden,N.J. P13 .....8.50
Canton,O. T7 .....7.425
Carnegie,Pa. C12 .....8.325
Chicago W18 .....8.325
Cleveland A7, C20 ....8.325
Detroit B5, P17 .....8.525
Detroit R7 .....8.325
Donora,Pa. A7 .....8.325
Elyria,O. W8 .....8.325
FranklinPark,Ill. N5 ..8.325
Gary,Ind. R2 .....8.325
GreenBay,Wis. F7 .....8.325
Hammond,Ind. L2,M13 8.325
Hartford,Conn. R2 ....8.625
Harvey,Ill. B5 .....8.325
Lackawanna,N.Y. B2 ..8.325
LosAngeles P2, S30 ...10.10
Mansfield,Mass. B5 ....8.625
Massillon,O. R2, R8 ..8.325
Midland,Pa. C18 .....8.325
Monaca,Pa. S17 .....8.325
Newark,N.J. W18 .....8.50
Plymouth,Mich. P5 ....8.525
S.Chicago W14 .....8.325
SpringCity,Pa. K3 .....8.50
Struthers,O. Y1 .....8.325
Warren,O. C17 .....8.325
Waukegan,Ill. A7 .....8.325
Worcester,Mass. A7 ...8.625
Youngstown F3, Y1 ....8.325

BARS, Reinforcing
(To Fabricators)
Ala.City,Ala. R2 .....5.075
Atlanta A11 .....5.575
Birmingham C15 .....5.375
Bridgeport,Conn. N19 ..5.30
Buffalo R2 .....5.075
Cleveland R2 .....5.075
Ecorse,Mich. G5 .....5.425
Emeryville,Calif. J7 ....5.85
Fairfield,Ala. T2 .....5.075
Fairless,Pa. U5 .....5.225

Ft.Worth,Tex.(42) T4 .5.525
Gary,Ind. U5 .....5.075
Houston B5 .....5.325
Ind.Harbor,Ind. I-2, Y1 5.075
Johnstown,Pa. B2 ....5.075
Joliet,Ill. P22 .....5.575
KansasCity,Mo. B5 ....5.325
Lackawanna,N.Y. B2 .5.075
LosAngeles B3 .....5.775
Milton,Pa. M18 .....5.225
Minnequa,Colo. C10 ..5.525
Niles,Calif. P1 .....5.85
Pittsburg,Calif. C11 ..5.775
Pittsburgh J5 .....5.075
Portland,Oreg. O4 ....5.85
SandSprings,Okla. B5..5.575
Seattle B3, N14 .....5.825
S.Chicago,Ill. R2 ....5.075
S.Duquesne,Pa. U5 ....5.075
S.SanFrancisco B3 ....5.825
SparrowsPoint,Md. B2.5.075
Sterling,Ill.(1) N15 ...5.075
Sterling,Ill. N15 .....5.175
Struthers,O. Y1 .....5.075
Torrance, Calif. C11 ..5.775
Youngstown R2, U5 ..5.075

BARS, Reinforcing (Fabricated; to Consumers)

Chicago U8 .....6.81
Cleveland U8 .....6.79
Johnstown,Pa. ¼-1" B2.6.73
KansasCity,Mo. B5 ....7.00
Marion,O. P11 .....6.70
New York U8 .....7.18
Pittsburgh U8 .....6.75
Seattle B3, N14 .....7.20
SparrowsPt. ¼-1" B2 ..6.73
Williamsport,Pa. B19 ..6.65

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 5.075
ChicagoHts.(4) I-2 ....5.075
ChicagoHts.(4) C2 ....5.65
Ft.Worth,Tex.(26) T4..5.525
Franklin,Pa.(4) F5 ....5.60
Franklin,Pa.(3) F5 ....5.10
JerseyShore,Pa.(4) J8 ..5.00
Marion,O. (3) P11 ....5.15
Moline,Ill.(3) R2 .....5.225
Tonawanda(3) B12 ....5.65
Tonawanda(4) B12 ....6.15
Williamsport,Pa.(3) B19.5.65

BARS, Wrought Iron

Economy,Pa.(B.R.)B14 12.305
Economy,Pa.(D.R.)B14 15.301
Economy(Staybolt)B14 15.676
McK.Rks.(B.R.) L5 ..13.15
McK.Rks.(D.R.) L5 ..18.00
McK.Rks.(Staybolt)L5 .19.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 ....4.675
Allenport,Pa. P7 .....4.675
Ashland,Ky.(8) A10 ..4.675
Cleveland J5, R2 ....4.675
Conshohocken,Pa. A3 ..4.725
Detroit(8) M1 .....4.775
Dravosburg,Pa. U5 ....4.675
Ecorse,Mich. G5 .....4.775
Fairfield,Ala. T2 ....4.675
Fairless,Pa. U5 .....4.725
Fontana,Calif. K1 ....5.475
Gary,Ind. U5 .....4.675
Geneva,Utah C11 ....4.775
GraniteCity,Ill.(8) G4 ..4.875
Ind.Harbor,Ind. I-2, Y1 4.675
Lackawanna,N.Y. B2..4.675
Munhall,Pa. U5 .....4.675
Newport,Ky.(8) N9 ..4.675
Niles,O. M21 .....4.675
Pittsburg,Calif. C11 ..5.375
Pittsburgh J5 .....4.675
Portsmouth O. P12 ....4.675
Riverdale,Ill. A1 .....4.675
Sharon,Pa. S3 .....4.675
S.Chicago,Ill. W14 ....4.675
SparrowsPoint,Md. B2..4.675
Steubenville,O. W10 ..4.675
Warren,O. R2 .....4.675
Weirton,W.Va. W6 ....4.675
Youngstown U5, Y1 ..4.675

SHEETS, H.R., (19 Ga. & Lighter)

Niles,O. M21 .....5.75

SHEETS, H.R. Alloy

Dravosburg,Pa. U5 ....7.75
Gary,Ind. U5 .....7.75
Ind Harbor,Ind. Y1 ....7.75
Newport,Ky. N9 .....7.75
Youngstown Y1, U5 ....7.75

SHEETS, H.R. (14 Ga. & Heavier) High-Strength Low-Alloy

Cleveland J5, R2 .....6.90
Conshohocken,Pa. A3 ..6.95
Dravosburg,Pa. U5 ....6.90
Ecorse,Mich. G5 .....7.00
Fairfield,Ala. T2 .....6.90
Fairless,Pa. U5 .....6.95
Fontana,Calif. K1 .....7.70
Gary,Ind. U5 .....6.90
Ind.Harbor,Ind. I-2, Y1 6.90
Lackawanna(35) B2 ....6.90
Munhall,Pa. U5 .....6.90
Pittsburgh J5 .....6.90
S.Chicago, Ill. U5 .....6.90
SparrowsPoint(36) B2 ..6.90
Warren,O. R2 .....6.90
Weirton,W.Va. W6 ....6.90
Youngstown U5, Y1 ....6.90

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...4.925
Cleveland R2 .....5.425
Ind.Harbor,Ind. I-2 ...4.925
Warren,O. R2 .....5.425

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....5.75
Cleveland J5, R2 ....5.75
Conshohocken,Pa. A3 ..5.80
Detroit M1 .....5.75
Dravosburg,Pa. U5 ....5.75
Ecorse,Mich. G5 .....5.85
Fairfield,Ala. T2 .....5.75
Fairless Pa. U5 .....5.80
Follansbee W.Va. F4 ..5.75
Fontana,Calif. K1 ....6.95
Gary,Ind. U5 .....5.75
GraniteCity,Ill. G4 ...5.95
Ind.Harbor,Ind. I-2, Y1 5.75
Lackawanna,N.Y. B2 ..5.75
Mansfield,O. E6 .....5.75
Middletown,O. A10 ....5.75
Newport,Ky. N9 .....5.75
Pittsburg,Calif. C11 ..6.70
Pittsburgh J5 .....5.75
Portsmouth O. P12 ....5.75
SparrowsPoint,Md. B2 .5.75
Steubenville, O. W10 ....5.75
Warren,O. R2 .....5.75
Weirton,W.Va. W6 ....5.75
Youngstown Y1 .....5.75

SHEETS, Cold-Rolled High-Strength, Low-Alloy

Cleveland J5, R2 .....8.525
Dravosburg,Pa. U5 ....8.525
Ecorse,Mich. G5 .....8.625
Fairless,Pa. U5 .....8.575
Fontana,Calif. K1 ....9.725
Gary,Ind. U5 .....8.525
IndianaHarbor,Ind. Y1..8.525
Lackawanna(37) B2 ..8.525
Pittsburgh J5 .....8.525
SparrowsPoint(38) B2 .8.525
Warren,O. R2 .....8.525
Weirton,W.Va. W6 ....8.525
Youngstown Y1 .....8.525

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.50
Middletown,O. A10 ....6.25
Warren,O. R2 .....6.50

SHEETS, Culvert

	Cu Steel	Cu Fe
Ashland,Ky. A10	6.65	6.90
Canton,O. R2	6.65	7.15
Dravosburg U5	6.65	6.90
Fairfield T2	6.65	6.90
Gary Ind. U5	6.65	6.90
GraniteCity,Ill. G4	6.85	...
Ind.Harbor I-2	6.65	6.90
Kokomo Ind. C16	6.75	...
MartinsFry. W10	6.65	...
Pitts.,Calif. C11	7.40	...
SparrowsPt. B2	6.65	...

SHEETS, Culvert—Pure Iron

Dravosburg,Pa. U5 ....6.90
Gary,Ind. U5 .....6.90
Ind.Harbor,Ind. I-2 ....6.90
MartinsFry.,O. W10 ....6.90

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....6.30†
Ashland,Ky. A10 .....6.30†
Canton,O. R2 .....6.30†
Dover,O. R1 .....6.30†
Dravosburg,Pa. U5 ....6.30†
Fairfield,Ala. T2 .....6.30†
Gary,Ind. U5 .....6.30†
GraniteCity,Ill. G4 ....6.50*
Ind Harbor,Ind. I-2 ...6.30†
Kokomo Ind. C16 .....6.40‡
MartinsFerry,O. W10 ..6.30*
Middletown,O. A10 ....6.30†
Pittsburg,Calif. C11 ..7.05*
Pittsburgh J5 .....6.30†
SparrowsPt.,Md. B2 ..6.30†
Warren,O. R2 .....6.30†
Weirton,W.Va. W6 ....6.30*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....6.975

SHEETS, Galvanized High-Strength Low-Alloy

Dravosburg,Pa. U5 ....9.275
SparrowsPoint(39) B2..9.275

SHEETS, Galvannealed Steel

Cleveland(28) R2 .....7.125
Niles,O.(28) R2 .....7.125
Weirton,W.Va. W6 ....6.975

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 8.95
Butler,Pa. A10 (type 2) 9.05

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.325
Cleveland R2 .....6.325
Dravosburg,Pa. U5 ....6.325
Gary,Ind. U5 .....6.325
GraniteCity,Ill. G4 ....6.525
Ind.Harbor,Ind. I-2, Y1 6.325
Middletown,O. A10 ....6.325
Niles,O. M21 .....6.325
Youngstown Y1 .....6.325

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..8.35
Ind.Harbor,Ind. I-2 ....8.175
Yorkville,O. W10 ....8.175

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10 6.70
Gary,Ind. U5 .....6.70
Mansfield O. E6 .....6.70
Middletown O. A10 ....6.70
Niles,O. M21 .....6.70
Weirton,W.Va. W6 ....6.70

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.10

Key To Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U.S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Dearborn Division Sharon Steel Corp.
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine&Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Division, Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.

N1 National Standard Co.
N2 National Supply Co.
N3 National Tube Div., U.S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest SteelRoll Mill
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co. Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service

T2 Tenn.Coal & Iron Div., U.S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U.S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U.S. Steel Supply Div. U.S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co., Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 We'rton Steel Co.
W7 W.Va. Steel & Mfg. Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.675
Allenport,Pa. P7	4.675
Alton,Ill. L1	4.875
Ashland,Ky.(8) A10	4.675
Atlanta A11	4.875
Bessemer,Ala. T2	4.675
Birmingham C15	4.975
Bridgeport,Conn. N19	4.625
Buffalo(27) R2	4.675
Conshohocken,Pa. A3	4.725
Detroit M1	4.775
Ecorse,Mich. G5	4.775
Fairfield,Ala. T2	4.675
Fontana,Calif. K1	5.475
Gary,Ind. U5	4.675
Houston S5	4.925
Ind.Harbor,Ind. I-2, Y1	4.675
Johnstown,Pa.(25) B2	4.675
KansasCity,Mo. S5	4.925
Lackaw'na,N.Y.(25) B2	4.675
LosAngeles(25) B3	5.425
Minnequa,Colo. C10	5.775
Pittsburg,Calif. C11	5.425
Riverdale,Ill. A1	4.675
SanFrancisco S7	5.95
Seattle(25) B3	5.675
Seattle N14	5.675
Sharon,Pa. S3	4.675
S.Chicago,Ill. W14	4.675
S.SanFrancisco(25) B3	5.425
SparrowsPoint,Md. B2	4.675
Sterling,Ill. (1) N15	4.675
Sterling,Ill. N15	4.775
Torrance,Calif. C11	5.425
Warren,O. R2	4.675
Weirton W.Va. W6	4.675
Youngstown U5	4.675

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19	7.50
Carnegie,Pa. S18	7.75
Dravosburg,Pa. U5	7.75
Gary,Ind. U5	7.75
Ind.Harbor Ind. Y1	7.75
LosAngeles B3	8.95
Newport Ky. N9	7.75
Sharon,Pa. S3	7.75
S.Chicago,Ill. W14	7.75
Youngstown U5, Y1	7.75

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2	6.95
Conshohocken,Pa. A3	6.95
Ecorse,Mich. G5	7.05
Fairfield Ala. T2	6.95
Gary,Ind. U5	6.95
Houston S5	7.20
Ind.Harbor Ind. I-2, Y1	6.95
KansasCity,Mo. S5	7.20
Lackawanna,N.Y. B2	6.95
LosAngeles(25) B3	7.70
Seattle(25) B3	7.95
Sharon,Pa. S3	6.95
S.SanFrancisco(25) B3	7.70
SparrowsPo'nt,Md. B2	6.95
Warren O. R2	6.95
Weirton W.Va. W6	6.95
Youngstown U5, Y1	6.95

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.925
Warren,O. R2	5.425

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	6.85
Baltimore T6	6.85
Boston T6	7.40
Buffalo S40	6.85
Cleveland A7, J5	6.85
Conshohocken,Pa. A3	6.90
Dearborn,Mich. D3	6.95
Detroit D2, M1, P20	6.95
Dover,O. G6	6.85
Ecorse,Mich. G5	6.95
Follansbee,W.Va. F4	6.85
Fontana,Calif. K1	8.60
FranklinPark,Ill. T6	6.95
Ind.Harbor Ind. Y1	6.85
Indianapolis C8	7.00
LosAngeles C1	8.80
NewBedford Mass. R10	7.30
NewBritain(10) S15	6.85
NewCastle,Pa. B4, E5	6.85
NewHaven,Conn. D2	7.30
NewKensington,Pa. A6	6.85
Pawtucket,R.I. R3	7.50
Pawtucket,R.I. N8	7.40
Pittsburgh J5	6.85
Riverdale Ill. A1	6.95
Rome,N.Y.(32) R6	6.85
Sharon,Pa. S3	6.85
Trenton,N.J.(31) R5	8.30
Wallingford,Conn. W2	7.30
Warren,O. R2, T5	6.85
Weirton,W.Va. W6	6.85
Worcester,Mass. A7	7.40
Youngstown C8, Y1	6.85

STRIP, Cold-Rolled Alloy

Boston T6	14.90
Carnegie,Pa. S18	14.55
Cleveland A7	14.55
Dover,O. G6	14.55
FranklinPark,Ill. T6	14.55
Harrison,N.J. C18	14.55
Indianapolis C8	14.70
Pawtucket,R.I. N8	14.90
Sharon,Pa. S3	14.55
Worcester,Mass. A7	14.85
Youngstown C8	14.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.00
Dearborn,Mich. D3	10.10
Dover,O. G6	10.10
Ecorse,Mich. G5	10.10
Ind.Harbor,Ind. Y1	10.20
Sharon,Pa. S3	10.00
Warren O. R2	10.00
Weirton,W.Va. W6	10.20
Youngstown Y1	10.20

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	8.50	10.10	12.90	15.30	18.25
Boston T6	8.50	10.10	12.90	15.30	18.25
Bristol,Conn. W1	...	...	12.90	15.30	18.25
Carnegie,Pa. S18	...	9.80	12.60	15.00	...
Cleveland A7	7.95	9.80	12.60	15.00	17.95
Cleveland C7	...	9.80	12.60	15.00	17.95
Dover,O. G6	7.95	9.80	12.60	15.00	17.95
Detroit D2	8.05	9.90	12.70	15.10	...
Dearborn,Mich. D3	8.05	9.90	12.70	...	...
FranklinPark,Ill. T6	8.05	9.80	12.60	15.00	17.95
Harrison N.J. C18	...	...	12.90	15.30	18.25
Indianapolis C8	8.10	9.95	12.60	15.00	17.95
NewBritain Conn.(10) S15	7.95	9.80	12.60	15.00	17.95
NewCastle,Pa. B4, E5	7.95	9.80	12.60	15.00	...
NewHaven,Conn. D2	8.40	10.10	12.90	15.30	...
NewKensington,Pa. A6	7.95	9.80	12.60	15.00	...
NewYork W3	...	10.10	12.90	15.30	18.25
Pawtucket,R.I. N8	8.50	10.10	12.90	15.30	18.25
Riverdale,Ill. A1	8.05	9.80	12.60	15.00	17.95
Rome,N.Y.(32) R6	7.95	9.80	12.60	15.00	17.95
Sharon,Pa. S3	7.95	9.80	12.60	15.00	17.95
Trenton,N.J. R5	...	10.10	12.90	15.30	18.25
Wallingford Conn. W2	8.40	10.10	12.90	15.30	18.15
Warren,O. T5	7.95	9.80	12.60	15.00	17.95
Weirton,W.Va. W6	7.95	9.80	12.60	15.00	17.95
Worcester,Mass. A7, T6	8.50	10.10	12.90	15.30	18.25
Youngstown C8	7.95	9.80	12.60	15.00	17.95

Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol Conn. W1	16.80	20.65	...
Buffalo W12	16.80	...	...
FranklinPark, Ill. T6	17.15	21.00	25.35
Harrison,N.J. C18	16.80	20.65	25.00
New York W3	16.80	20.65	25.00
Palmer,Mass. W12	16.80	...	...
Trenton,N.J. R5	16.80	20.65	25.00
Worcester,Mass. W12	14.80	...	...
Worcester,Mass. A7, T6	16.80	20.65	25.00
Youngstown C8	17.15	21.00	25.35

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	7.60

STRIP, Electrogalvanized

Cleveland A7	6.85*
Dover,O. G6	6.85*
Riverdale,Ill. A1	6.95*
Warren,O. B9, T5	6.85*
Worcester,Mass. A7	7.40*
Youngstown C8	6.85*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	6.975

TIGHT COOPERAGE HOOP

Atlanta A11	5.40
Riverdale,Ill. A1	5.25
Sharon,Pa. S3	5.10
Youngstown U5	5.10

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	...	...	11.00	12.05	13.05
Brackenridge,Pa. A4	...	...	11.00	12.05	13.05
Mansfield,O. E6	9.20	10.35	11.00	12.05	13.05
Newport,Ky. N9	9.20	10.35	11.00	12.05	13.05
Niles,O. M21	9.20	10.35	11.00	12.05	...
Vandergrift,Pa. U5	...	10.35	11.00	12.05	13.05
Warren,O. R2	9.20	10.35	11.00	12.05	...
Zanesville,O. A10	...	10.35	11.00	12.05	13.05
Zanesville O. A10 (FP coils)	...	10.85	11.525	12.575	13.55
Zanesville,O. A10 (SP coils)	...	...	11.025	12.075	13.05

C.R. COILS & CUT LENGTHS, (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	...	...	11.525	12.575	13.55
GraniteCity,Ill. G4	9.40*	10.55*	11.225*	12.275*	...
IndianaHarbor,Ind. I-2	9.20†	10.35*	11.025*	12.075*	...
Mansfield,O. E6	9.70	10.85	11.525	12.575	13.55
Vandergrift,Pa. U5	9.20*	10.35*	11.025*	12.075*†	13.05*
Vandergrift,Pa. U5	...	10.85†	11.525†	12.575†	13.55†
Warren,O. R2	9.20*	10.85	11.525	12.575	13.55

H.R. SHEETS (22 Ga., cut lengths)

	Transformer Grades T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	14.05	14.60	15.10	16.15
Brackenridge,Pa. A4	14.05	...	...	...
Vandergrift,Pa. U5	14.05	14.60	15.10	16.15
Zanesville,O. A10	14.05	14.60	15.10	16.15

C.R. COILS & CUT LENGTHS (22 Ga.)

	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	16.90	18.50	19.00	19.50	14.05**	
Butler,Pa. A10	...	...	18.50	19.00	19.50	...
Vandergrift,Pa. U5	15.90	16.90	18.50	19.00	19.50	14.55**
Warren O. R2	...	...	...	...	...	14.55†

*Semiprocessed. †Fully processed only. †Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.40	$8.65	$9.05
Dravosburg,Pa. U5	8.40	8.65	9.05
Fairfield,Ala. T2	8.50	8.75	9.15
Fairless,Pa. U5	8.50	8.75	9.15
Fontana,Calif. K1	9.15	9.40	9.80
Gary,Ind. U5	8.40	8.65	9.05
GraniteCity,Ill. G4	8.50	8.75	9.15
IndianaHarbor,Ind. I-2, Y1	8.40	8.65	9.05
Niles,O. R2	8.40	8.65	9.05
Pittsburg,Calif. C11	9.15	9.40	9.80
SparrowsPoint,Md. B2	8.50	8.75	9.15
Weirton,W.Va. W6	8.40	8.65	9.05
Yorkville,O. W10	8.40	8.65	9.05

ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Aliquippa,Pa. J5	6.975	...	...
Niles,O. R2	7.425	7.625	7.825

TINPLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$9.70	$9.95
Dravosburg,Pa. U5	9.70	9.95
Fairfield,Ala. T2	9.80	10.05
Fairless,Pa. U5	9.80	10.05
Fontana,Calif. K1	10.45	10.70
Gary,Ind. U5	9.70	9.95
Ind.Harbor Y1	9.70	9.95
Pitts.,Calif. C11	10.45	10.70
Sp.Pt.,Md. B2	9.80	10.05
Weirton,W.Va. W6	9.70	9.95
Yorkville,O. W10	9.70	9.95

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$7.50
Dravosburg,Pa. U5	7.50
Fairfield,Ala. T2	7.60
Fairless,Pa. U5	7.60
Fontana,Calif. K1	8.25
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind. I-2, Y1	7.50
Niles,O. R2	7.50
Pittsburg,Calif. C11	8.25
SparrowsPoint,Md. B2	7.60
Weirton,W.Va. W6	7.50
Yorkville,O. W10	7.50

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg,Pa. U5	$7.15
Gary,Ind. U5	7.15
GraniteCity,Ill. G4	7.25
Ind.Harbor,Ind. Y1	7.15
Yorkville,O. W10	7.15

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5	$9.20
Gary,Ind. U5	9.20

ROOFING SHORT TERNES (8 lb Coated; Base Box)

Gary,Ind. U5	$10.75

ROPE WIRE

	(A)
Bartonville,Ill. K4	11.55
Buffalo W12	11.55
Fostoria,O. S1	11.55
Johnstown,Pa. B2	11.55
Monessen,Pa. P7, P16	11.55
Muncie,Ind. I-7	11.75
Palmer,Mass. W12	11.85
Roebling,N.J. R5	11.85
SparrowsPt.,Md. B2	11.65
Struthers,O. Y1	11.55
Worcester,Mass. J4	11.85

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	7.20
Aliquippa,Pa. J5	7.20
Alton,Ill. L1	7.40
Atlanta A11	7.40
Bartonville,Ill. K4	7.30
Buffalo W12	7.20
Chicago W13	7.20
Cleveland A7, C20	7.20
Crawfordsville,Ind. M8	7.30
Donora,Pa. A7	7.20
Duluth A7	7.20
Fairfield,Ala. T2	7.20
Fostoria,O.(24) S1	7.30
Houston S5	7.45
Jacksonville,Fla. M8	7.55
Johnstown,Pa. B2	7.20
Joliet,Ill. A7	7.20
KansasCity,Mo. S5	7.45
Kokomo,Ind. C16	7.30
LosAngeles B3	8.15
Minnequa,Colo. C10	7.45
Monessen,Pa. P7, P16	7.20
N.Tonawanda,N.Y. B11	7.20
Palmer,Mass. W12	7.50
Pittsburg,Calif. C11	8.15
Portsmouth,O. P12	7.20
Rankin,Pa. A7	7.20
S.Chicago,Ill. R2	7.20
S.SanFrancisco C10	8.15
SparrowsPoint,Md. B2	7.30
Sterling,Ill.(1) N15	7.20
Sterling,Ill. N15	7.30
Struthers,O. Y1	7.20
Waukegan,Ill. A7	7.20
Worcester,Mass. A7	7.50

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	11.75
Buffalo W12	11.75
Johnstown,Pa. B2	11.75
Minnequa,Colo. C10	11.875
Monessen,Pa. P16	11.75
Muncie,Ind. I-7	11.95
Palmer,Mass. W12	12.05
Pittsburg,Calif. C11	12.55
Portsmouth,O. P12	11.75
Roebling,N.J. R5	12.05
SparrowsPt.,Md. B2	11.85
Struthers,O. Y1	11.75

WIRE, Upholstery Spring

Aliquippa,Pa. J5	8.40
Alton,Ill. L1	8.60
Buffalo W12	8.40
Cleveland A7	8.40
Donora,Pa. A7	8.40
Duluth A7	8.40
Johnstown,Pa. B2	8.40
KansasCity,Mo. S5	8.65
LosAngeles B3	9.35
Minnequa,Colo. C10	8.60
Monessen,Pa. P7, P16	8.40
NewHaven,Conn. A7	8.70
Palmer,Mass. W12	8.70
Pittsburg,Calif. C11	9.35
Portsmouth,O. P12	8.40
Roebling,N.J. R5	8.70
S.Chicago,Ill. R2	8.40
S.SanFrancisco C10	9.35
SparrowsPoint,Md. B2	8.50
Struthers,O. Y1	8.40
Trenton,N.J. A7	8.70
Waukegan,Ill. A7	8.40
Worcester,Mass. A7	8.70

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	8.725
Alton,Ill. L1	8.925
Bartonville,Ill. K4	8.825
Buffalo W12	8.725
Cleveland A7	8.725
Donora,Pa. A7	8.725
Duluth A7	8.725
Fostoria,O. S1	8.775
Johnstown,Pa. B2	8.725
LosAngeles B3	9.675
Milbury,Mass.(12) N6	9.025
Minnequa,Colo. C10	8.975
Monessen,Pa. P7, P16	8.725
Muncie,Ind. I-7	8.925
Palmer,Mass. W12	9.025
Pittsburg,Calif. C11	9.675
Portsmouth,O. P12	8.725
Roebling,N.J. R5	9.025
S.Chicago,Ill. R2	8.725
S.SanFrancisco C10	9.675
SparrowsPt.,Md. B2	8.825
Struthers,O. Y1	8.725
Trenton,N.J. A7	9.025
Waukegan,Ill. A7	8.725
Worcester A7, J4, T6	9.025

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	14.35
Bartonville,Ill. K4	14.25
Buffalo W12	14.15
Chicago W13	13.55
Cleveland A7	14.15
Crawfordsville,Ind. M8	14.25
Fostoria,O. S1	14.15
Jacksonville,Fla. M8	14.50
Johnstown,Pa. B2	14.15
Kokomo,Ind. C16	14.15
Minnequa,Colo. C10	13.90
Monessen,Pa. P6	14.15
Muncie,Ind. I-7	14.35
Palmer,Mass. W12	14.45
Roebling,N.J. C10	14.45
S.SanFrancisco C10	14.50
Waukegan,Ill. A7	14.15
Worcester,Mass. A7, T6	14.45

WIRE

WIRE, Tire Bead

Bartonville,Ill. K4	15.25
Monessen,Pa. P16	14.45
Roebling,N.J. R5	14.35

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	10.75
Baltimore T6	11.05
Boston T6	11.05
Buffalo W12	10.75
Cleveland A7	10.75
Crawfordsville,Ind. M8	10.75
Dover,O. G6	10.75
Fostoria,O. S1	10.75
FranklinPark,Ill. T6	10.85
Kokomo,Ind. C16	10.75
Massillon,O. R8	10.75
Milwaukee C23	10.95
Monessen,Pa. P7, P16	10.75
NewKensington,Pa. A6	10.75
Palmer,Mass. W12	11.05
Pawtucket,R.I. N8	11.05
Riverdale,Ill. A1	10.85
Rome,N.Y. R6	10.75
Trenton,N.J. R5	11.05
Worcester,Mass. A7, T6	11.05

NAILS, Stock — **Col.**

AlabamaCity, Ala. R2	.164
Aliquippa,Pa. (7) J5	.167
Atlanta A11	.166
Bartonville,Ill. (7) K4	.169
Chicago (7) W13	.167
Cleveland (7) A9	.173
Crawfordsville,Ind.(7) M8	169
Donora,Pa. A7	.164
Duluth A7	.164
Fairfield,Ala. T2	.164
Houston,Tex 85	.169
Jack'ville,Fla.(7)(20)M8	178
Johnstown,Pa. B2	.164
Joliet Ill. A7	.164
Kansas City,Mo. 85	.169
Kokomo,Ind. C16	.166
Minnequa,Colo. C10	*169*
Monessen,Pa. (7) P7	.167
Pittsburg,Calif. C11	.183
Rankin,Pa. A7	.164
S.Chicago,Ill. R2	.164
SparrowsPt.,Md. B2	.166
Sterling,Ill.(1) N15	.164
Worcester,Mass. A7	.170

(To Wholesalers; per cwt)

Galveston,Tex. D7 ... $8.75

NAILS, Cut (100 lb keg)
To Dealers (33)

Conshohocken,Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

STAPLES, Polished Stock — **Col.**

AlabamaCity, Ala. R2	.164
Aliquippa,Pa. (7) J5	.167
Atlanta A11	.166
Bartonville,Ill. (7) K4	.169
Crawfordsville,Ind.(7)M8	169
Donora,Pa. A7	.164
Duluth A7	.164
Fairfield,Ala. T2	.164
Houston,Tex 85	.169
Jack'ville,Fla.(7)(20)M8	178
Johnstown,Pa. B2	.164
Joliet,Ill. A7	.164
Kansas City,Mo. 85	.169
Kokomo,Ind. C16	.166
Minnequa,Colo. C10	*169*
Monessen,Pa. (7) P7	.167
Pittsburg,Calif. C11	.183
Rankin,Pa. A7	.164
S.Chicago,Ill. R2	.164
SparrowsPt.,Md. B2	.166
Sterling,Ill.(1) N15	.164
Worcester,Mass. A7	.170

TIE WIRE, Automatic Baler (14½ Ga.) (Per 97 lb Net Box)
Coil No. 3150

AlabamaCity,Ala. R2	$9.53
Atlanta A11	9.63
Bartonville,Ill. K4	10.13
Buffalo W12	10.05
Crawfordsville,Ind. M8	10.13
Donora,Pa. A7	9.53
Duluth A7	9.63
Houston 85	9.78
Jacksonville,Fla. M8	10.58
Johnstown,Pa. B2	9.53
Joliet,Ill. A7	9.53
KansasCity,Mo. 85	9.78
Kokomo,Ind. C16	9.63
LosAngeles B3	10.32
Minnequa,Colo. C10	*9.78*
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.53
S.SanFrancisco C10	*10.31*
SparrowsPt.,Md. B2	9.63
Sterling,Ill.(1) N15	9.53

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.85
Atlanta A11	9.95
Bartonville,Ill. K4	10.45
Buffalo W12	10.35
Crawfordsville,Ind. M8	10.45
Donora,Pa. A7	9.85
Duluth A7	9.85
Houston 85	10.10
Kokomo,Ind. C16	9.95
Jacksonville,Fla. M8	10.91
Johnstown,Pa. B2	9.85
Joliet,Ill. A7	9.85
KansasCity,Mo. 85	10.10
Kokomo,Ind. C16	10.45
LosAngeles B3	10.65
Minnequa,Colo. C10	*10.10*
Pittsburg,Calif. C11	10.65
S.Chicago,Ill. R2	9.85
S.SanFrancisco C10	*10.65*
SparrowsPt.,Md. B2	9.95
Sterling,Ill.(1) N15	9.85

Coil Interim

AlabamaCity,Ala. R2	$9.90
Atlanta A11	10.00
Bartonville,Ill. K4	10.50
Buffalo W12	10.40
Crawfordsville,Ind. M8	10.50
Donora,Pa. A7	9.90
Houston 85	10.15
Jacksonville,Fla. M8	10.96
Johnstown,Pa. B2	9.90
Joliet,Ill. A7	9.90
KansasCity,Mo. 85	10.15
Kokomo,Ind. C16	10.00
LosAngeles B3	10.70
Minnequa,Colo. C10	*10.15*
Pittsburg,Calif. C11	10.70
S.Chicago,Ill. R2	9.90
S.SanFrancisco C10	*10.70*
SparrowsPt.,Md. B2	10.00
Sterling,Ill.(1) N15	9.90

WIRE, Borbed — **Col.**

AlabamaCity,Ala. R2	.184**
Aliquippa,Pa. J5	.184§
Atlanta A11	.190*
Bartonville,Ill. K4	.193
Crawfordsville,Ind. M8	.193
Donora,Pa. A7	.184†
Duluth A7	.184†
Fairfield,Ala. T2	.184†
Houston,Tex 85	.189**
Jacksonville,Fla. M8	.198
Johnstown,Pa. B2	.188*
Joliet,Ill. A7	.184†
KansasCity,Mo. 85	.189**
Kokomo,Ind. C16	.186†
Minnequa,Colo. C10	*189**
Monessen,Pa. P7	.191*
Pittsburg,Calif. C11	.204†
Rankin,Pa. A7	.184†
S.Chicago,Ill. R2	.184**
S.SanFrancisco C10	.207**
SparrowsPoint,Md. B2	190*
Sterling,Ill.(1) N15	.188*

WOVEN FENCE, 9-15 Ga. — **Col.**

Ala.City,Ala. R2	.176**
Alig'ppa,Pa. 9-14½ga.J5	184§
Atlanta A11	.182*
Bartonville,Ill. K4	.187
Crawfordsville,Ind. M8	.187
Donora,Pa. A7	.176†
Duluth A7	.176†
Fairfield,Ala. T2	.176†
Houston,Tex 85	.181**
Jacksonville Fla. M8	.192
Johnstown,Pa.(43) B2	.180*
Joliet,Ill. A7	.176†
KansasCity,Mo. 85	.181**
Kokomo,Ind. C16	.178†
Minnequa,Colo. C10	*181**
Monessen,Pa. 9 ga. P7	185*
Pittsburg,Calif. C11	.199†
Rankin,Pa. A7	.176†
S.Chicago,Ill. R2	.176**
Sterling,Ill.(1) N15	.180*

WIRE (16 gage) — **An'ld Galv. Stone** — **Stone**

Ala.City,Ala. R2	15.70	17.25**
Bartonville K4	16.10	18.05
Buffalo W12	16.10	
Cleveland A7	15.70	17.25†
Crawf'dsville M8	16.20	18.15
Fostoria,O S1	16.20	17.75†
Houston 85	15.95	17.50**
Jacksonville M8	16.45	18.40
Johnstown B2	16.10	18.05*
Kan.City,Mo.85	15.95	17.50**
Kokomo C16	15.80	17.35†
Minnequa C10	16.45	18.15**
P'lm'r,Mass.W12	16.10	17.65*
Pitts.,Calif. C11	16.05	17.60†
SparrowsPt. B2	16.20	18.15*
Sterling(1) N15	16.10	18.05*
Waukegan A7	15.70	17.25†
Worcester A7	16.00	

WIRE, Merchant Quality

	(6 to 8 gage)	An'ld	Galv.
Ala.City,Ala. R2	7.95	8.35**	
Aliquippa J5	8.10	8.625§	
Atlanta A11	8.05	8.65*	
Bartonville(48) K4	8.20	8.80	
Buffalo W12	8.10	8.50†	
Cleveland A7	7.95		
Crawfordsville M8	8.20	8.80	
Donora,Pa. A7	7.95	8.35†	
Duluth A7	7.95	8.35†	
Fairfield T2	7.95	8.35†	
Houston(48) 85	8.20	8.60**	
Jacks'ville,Fla. M8	8.45	9.05	
Johnstown B2(48)	7.95	8.55*	
Joliet,Ill. A7	7.95	8.35†	
Kans.City(48) 85	8.20	8.60**	
Kokomo C16	8.05	8.45†	
LosAngeles B3	8.90	9.50*	
Minnequa C10	*8.20*	*8.60***	
Monessen P7 (48)	8.10	8.70*	
Palmer,Mass. W12	8.40	8.80†	
Pitts.,Calif. C11	8.90	9.30†	
Portsmouth,O. P12	8.10		
Rankin,Pa. A7	7.95	8.35†	
S.Chicago R2	7.95	8.35**	
S.SanFran. C10	*8.90*	*9.30***	
Spar'wsPt. B2(48)	8.05	8.65*	
Sterling(1)(48)N15	7.95	8.55*	
Struth'rs,O.(48) Y1	7.95	8.45‡	
Worcester,Mass. A7	8.25	8.65†	

Based on zinc price of: *13.50c. †5c. §10c. ‡Less than 10c. ††13c. **Subject to zinc equalization extras.

BALE TIES, Single Loop — **Col.**

AlabamaCity,Ala. R2	.190
Atlanta A11	.19-
Bartonville,Ill. K4	.197
Crawfordsville,Ind. M8	.197
Donora,Pa. A7	.190
Duluth A7	.190
Fairfield,Ala. T2	.190
Houston 85	.195
Jacksonville,Fla. M8	.202
Joliet,Ill. A7	.190
KansasCity,Mo. 85	.195
Kokomo,Ind. C16	.192
Minnequa,Colo. C10	*.195*
Pitts. Calif. C11	.214
S.Chicago,Ill. R2	.190
S.SanFrancisco C10	*.214*
SparrowsPoint,Md. B2	.192
Sterling,Ill. N15	.190
Tonawanda,N.Y. B12	.169
Williamsport,Pa. S19	.175

FENCE POSTS

ChicagoHts.,Ill. C2, I-2..	167
Duluth A7	167
Franklin,Pa. F5	167
Huntington,W.Va. W7	169
Johnstown,Pa. B2	167
Marion,O. P11	167
Minnequa,Colo. C10	172
S.Chicago,Ill. R2	167
Sterling,Ill. N15	167
Tonawanda,N.Y. B12	169
Williamsport,Pa. S19	175

FASTENERS

(Based discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts
Full Size Body (cut thread)

½ in. and smaller:	
6 in. and shorter	55
Longer than 6 in.	46.5
⅝ in. thru 1 in.:	
6 in. and shorter	46.5
Longer than 6 in.	44
1⅛ in. and larger:	
All lengths	44

Undersized Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	55

Carriage, Machine, Lag Bolts
Hot Galvanized:

½ in. and smaller:	
6 in. and shorter	35
Longer than 6 in.	23
⅝ in. thru 1 in.:	
6 in. and shorter	20
Longer than 6 in.	20
1⅛ in. and larger:	
All lengths	20

Lag Bolts

All diameters:	
6 in. and shorter	55
Longer than 6 in.	47

Plow and Tap Bolts

½ in. and smaller by 6 in. and shorter	54
Larger than ½ in. or longer than 6 in.	47
Blank Bolts	47
Step, Elevator, Tire Bolts	54

NUTS

Reg. & Heavy Square Nuts:

All sizes	59

Square Nuts, Reg. & Heavy, Hot Galvanized:

All sizes	45

Hex Nuts, Reg. & Heavy, Hot Pressed:

⅜ in. and smaller	63
⅞ in. to 1 in. incl.	59.5
1⅛ in. to 1½ in., incl.	64
1⅝ in. and larger	58

Hex Nuts, Reg. & Heavy, Cold Punched:

⅜ in. and smaller	63
⅞ in. to 1½ in., incl.	59.5
1⅝ in. and larger	58

Hex Nuts, All Types, Hot Galvanized:

⅜ in. and smaller	50
⅞ in. to 1 in., incl.	46
1⅛ in. to 1½ in., incl.	51

Hex Nuts, Semifinished, Reg. & Heavy (Incl. Slotted):

⅜ in. and smaller	63
⅞ in. to 1½ in., incl.	59.5
1⅝ in. and larger	58

Hex Nuts, Finished (Incl. Slotted and Castellated):

1 in. and smaller	65
1⅛ in. to 1½ in., incl.	62
1⅝ in. and larger	58

CAP AND SET SCREWS
(Based discounts, packages, per cent off list f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread Bright:

6 in. and shorter:	
¼ in. and smaller	47
⅜, ⅞ and 1 in. diam.	31
Longer than 6 in.:	
⅜ in. and smaller	18.5
⅜, ⅞ and 1 in. diam.	5.5

High Carbon, Heat Treated:

6 in. and shorter:	
¼ in. and smaller	34
⅜, ⅞ and 1 in. diam.	13
Longer than 6 in.:	
¼ in. and smaller	+1
⅜, ⅞ and 1 in. diam.	+19

Fillister Head, Coarse Thread:

Listed Sizes	+31

Flat Head, Coarse Head:

¼ in. and smaller by 6 in. and shorter	+57

Set Screws, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:	
6 in. and shorter	11
Longer than 6 in.	+10

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 10.85
$\frac{7}{8}$-in. under List less 26.5%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	23.56	22.84
1¼	13	....	27.92	22.68
1½	13	26.34	30.86	25.08
1⅝	13	31.12	36.45	29.64
2	13	34.88	40.85	33.21
2¼	13	39.29	46.01	37.42
2½	12	42.64	49.94	40.61
2⅝	12	46.98	55.01	44.73
2¾	12	50.86	59.57	48.44
3	12	54.24	63.53	51.66

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	5.075	4.975	5.025	6.00
Ensley Ala. T2	5.075	4.975	....	6.00
Fairfield,Ala. T2	....	....	....	6.00
Gary Ind. U5	5.075	4.975	5.025	....
Huntington,W.Va. W7	....	....	....	6.15
IndianaHarbor,Ind. I-2	5.075	4.975	5.025	....
Johnstown,Pa. B2	....	....	....	(16)6.00
Lackawanna,N.Y. B2	5.075	4.975	....	(16)6.00
Minnequa,Colo. C10	5.075	4.975	....	6.50
Steelton Pa. B2	5.075	4.975	....	....
Williamsport,Pa. S19	....	....	....	6.15

TIE PLATES

Fairfield,Ala. T2	6.025
Gary,Ind. U5	6.025
Ind Harbor,Ind. I-2	6.025
Lackawanna,N.Y. B2	6.025
Minnequa,Colo. C10	6.025
Seattle B3	6.175
Steelton,Pa. B2	6.025
Torrance,Calif. C11	6.175

JOINT BARS

Bessemer,Pa. U5	6.35
Fairfield,Ala. T2	6.35
Ind Harbor,Ind. I-2	6.35
Joliet,Ill. U5	6.35
Lackawanna,N.Y. B2	6.35
Minnequa,Colo. C10	6.35
Steelton,Pa. B2	6.35

AXLES

Ind.Harbor,Ind. S13	8.10
Johnstown,Pa. B2	8.10

TRACK BOLTS, Untreated

Cleveland R2	13.10
Lebanon,Pa. B2	13.10
Minnequa,Colo. C10	13.10
Pittsburgh P14	13.10
Seattle B3	13.60

SCREW SPIKES

Cleveland R2	12.85
Pittsburgh P14	12.85

STANDARD TRACK SPIKES

Fairfield, Ala. T2	8.775
Ind.Harbor,Ind. I-2, Y1	8.775
KansasCity, Mo. 85	8.775
Lebanon,Pa. B2	8.775
Minnequa,Colo. C10	8.775
Pittsburgh J5	8.775
Seattle B3	9.275
S.Chicago,Ill. R2	8.775
Struthers,O. Y1	8.775
Youngstown R2	8.775

Footnotes

(1) Chicago base.
(2) Angles,flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in.; 6.25c; 1 15/16 to 8 in.; inclusive, 6.60c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 5.685c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.80c, for widths ⅝-in and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.038"; 0.034" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(48) 6-7 Ga.
(49) 3½-in. and smaller rounds; 8.65c, over 3½-in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+2	+20	4.5	+14.25	7	+11.75	8.5	+10.25	8.5	+10.25	8.25	+10.5	10.75	+8
Ambridge, Pa. N2	+2	....	4.5	....	7	....	8.5	....	8.5	....	8.25	....	10.75	....
Lorain, O. N3	+2	+20	4.5	+14.25	7	+11.75	8.5	+10.25	8.5	+10.25	8.25	+10.5	10.75	+8
Youngstown Y1	0.5	+17.5	4.5	+14.25	7	+11.75	8.5	+10.25	8.5	+10.25	8.25	+10.5	10.75	+8

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+2	+20	4.5	+14.25	7	+11.75	8.5	+10.25	8.5	+10.25	8.25	+10.5	10.75	+8

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Alton, Ill. L1	....	....	....	....	....	....	10.5	+3.75	13.5	+4.75	16	+1.25	18.5	0.5
Benwood, W. Va. W10	10	+20.5	+0.25	+27.75	+9.75	+37.25	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Butler, Pa. F6	10	+20.5	0.5	+27	+8.5	+36	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Fairless, Pa. N3	....	....	....	....	....	....	10.5	+8.75	13.5	+4.75	16	+1.25	18.5	0.5
Fontana, Calif. K1	....	....	....	....	....	....	9	+19.25	3	+15.25	5.5	+11.75	8	+10
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	11.5	+7.75	14.5	+3.75	17	+0.25	19.5	1.5
Lorain, O. N3	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Sharon, Pa. S4	11	+19.5	1.5	+26	+7.5	+35	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Sparrows Pt., Md. B2	9	+21.5	0.5	+28	+9.5	+37	10.5	+8.75	13.5	+4.75	16	+1.25	18.5	0.5
Wheatland, Pa. W9	11	+19.5	1.5	+26	+7.5	+35	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5
Youngstown R2, Y1	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	20.5	2.5

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	21	3.5	21.5	4	23	4.75	23	4.75	....	....	....	....
Alton, Ill. L1	19	1.5	19.5	2	21	2.75	21	2.75	....	....	....	....
Benwood, W. Va. W10	21	3.5	21.5	4	23	4.75	23	4.75	13.5	+0.75	13.5	+5.25
Etna, Pa. N2	21	3.5	21.5	4	23	4.75	23	4.75	13.5	+5.25	13.5	+5.25
Fairless, Pa. N3	19	1.5	19.5	2	21	2.75	21	2.75	11.5	+7.25	11.5	+7.25
Fontana, Calif. K1	8.5	+9	9	+8.5	10.5	+7.75	10.5	+7.75	1	+17.75	1	+17.75
Indiana Harbor, Ind. Y1	20	2.5	20.5	3	22	3.75	22	3.75	12.5	+6.25	12.5	+6.25
Lorain, O. N3	21	3.5	21.5	4	23	4.75	23	4.75	....	....	....	....
Sharon Pa. M6	21	3.5	21.5	4	23	4.75	23	4.75	....	....	....	....
Sparrows Pt. Md. B2	19	1.5	19.5	2	21	2.75	21	2.75	11	+7.25	11	+7.25
Wheatland, Pa. W9	21	3.5	21.5	4	23	4.75	23	4.75	13.5	+5.25	13.5	+5.25
Youngstown R2, Y1	21	3.5	21.5	4	23	4.75	23	4.75	13.5	+5.25	13.5	+5.25

*Galvanized pipe discounts based on current price of zinc (13.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingot	Rerolling Slabs	Forging Billets	Seamless Tube Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	19.75	24.50	....	....	33.00	....	....	....	45.00	41.50
202	21.00	27.25	33.00	....	35.75	37.25	39.25	41.25	45.25	45.25
301	20.50	25.25	33.75	....	34.00	38.25	40.50	42.50	47.25	43.75
302	22.00	28.00	34.00	....	36.75	38.75	40.75	43.00	47.50	47.50
302B	21.75	28.25	35.25	....	40.25	38.75	40.75	43.00	50.00	50.00
303	....	28.50	37.00	....	....	41.50	43.75	45.50	52.00	52.00
304	23.25	29.25	36.00	....	39.75	40.75	43.00	45.75	50.25	50.25
304L	....	....	43.50	....	46.75	48.25	50.50	53.25	57.75	57.75
305	24.75	32.50	37.75	....	43.00	40.75	43.00	46.25	53.50	53.50
308	26.75	34.00	42.50	....	45.50	48.25	50.50	55.00	57.50	57.50
309	34.75	44.00	51.50	....	58.50	57.50	60.50	64.25	73.50	73.50
310	42.25	53.75	69.00	....	75.50	77.50	81.50	83.25	87.00	87.00
314	....	....	....	....	....	77.50	....	83.25	....	....
316	35.25	44.50	56.25	....	63.50	63.50	66.75	70.25	74.75	74.75
316L	....	....	63.75	....	70.00	71.00	74.25	77.75	82.25	82.25
317	43.00	54.50	70.00	....	81.50	79.50	83.50	86.25	93.25	93.25
321	28.25	35.75	42.25	....	48.75	48.00	50.25	54.50	60.00	60.00
18-8CbTa	32.75	42.00	50.25	....	58.25	56.25	59.00	63.75	73.00	73.00
403	....	....	30.75	....	....	34.50	36.25	38.75	46.50	46.50
405	18.75	24.50	28.50	....	34.50	32.50	34.00	36.00	45.00	45.00
410	16.00	20.75	27.25	....	29.75	31.00	32.50	33.75	38.75	38.75
416	....	....	27.75	....	....	31.50	33.00	34.75	46.50	46.50
420	....	32.25	33.00	....	40.25	37.75	39.75	43.50	59.50	59.50
430	16.25	21.00	27.75	....	30.75	31.50	33.00	34.50	39.25	39.25
430F	....	....	28.25	....	....	32.00	33.50	35.25	49.75	49.75
431	....	27.25	35.50	....	....	39.75	41.75	43.50	53.00	53.00
446	....	....	37.75	....	56.75	42.50	44.75	46.00	67.25	67.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Div., H. K. Porter Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U.S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Elwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; National-Standard Co.; National Tube Div., U.S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	33.25
304	....	34.50	....	41.50	35.25
304-L	....	37.20	....	44.65	....
316	....	38.70	....	46.65	52.25
316-L	....	40.70	....	48.70	....
316-CB	....	45.90	....	54.75	....
321	....	36.35	....	43.40	42.00
347	....	39.50	....	48.45	51.00
405	....	29.20	....	37.05	....
410	....	28.70	....	36.55	....
430	....	28.70	....	36.55	....
Inconel	48.70	54.80	63.85	73.00	....
Nickel	37.95	46.25	54.60	62.95	....
Nickel, Low Carbon	38.25	46.90	55.60	64.40	....
Monel	40.30	49.10	57.95	66.80	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Strip, Carbon Base —Cold Rolled— Both Sides
Copper*	33.60	41.40

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22 Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.290	Cr Hot Work	0.45-0.495
Extra Carbon	0.345	W-Cr Hot Work	0.043-0.475
Special Carbon	0.41-0.45	V-Cr Hot Work	0.460
Oil Hardening	0.450	Hi-Carbon-Cr	0.830

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	4.170
18.25	4.25	1	4.75	....	2.385
18	4	2	9	....	2.7575
18	4	2	....	....	1.845
18	4	1	....	....	1.680
9	3.5	..	....	....	1.275
13.5	4	3	....	....	1.945
13.75	3.75	2	5	....	2.325
6.4	4.5	1.9	....	5	1.185
6	4	3	....	6	1.430
1.5	4	1	....	8.5	1.040

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

Birmingham District	Basic	No. 2 Foundry	Malleable	Bessemer
AlabamaCity,Ala. R2	58.50	59.00	....	....
Birmingham R2	58.50	59.00‡	....	....
Birmingham U6	....	59.00‡	63.00	....
Woodward,Ala. W15	58.50	59.00‡	63.00	....
Cincinnati, deld.	....	66.70	....	....
Buffalo District				
Buffalo H1, R2	62.50	63.00	63.50	64.00
Tonawanda,N.Y. W12	62.50	63.00	63.50	64.00
N.Tonawanda,N.Y. T9	....	63.00	63.50	64.00
Boston, deld.	73.79	74.29	74.79	....
Rochester,N.Y., deld.	65.52	66.02	66.52	....
Syracuse,N.Y., deld.	66.62	67.12	67.62	....
Chicago District				
Chicago I-3	62.50	63.00	63.00	63.50
Gary,Ind. U5	62.50	....	63.00	....
S.Chicago,Ill. R2	62.50	....	63.00	....
S.Chicago,Ill. Y1	62.50	63.00	63.00	....
S.Chicago,Ill. U5	62.50	....	63.00	63.50
S.Chicago,Ill. W14	62.50	....	63.00	63.50
Milwaukee, deld.	64.80	65.30	65.30	65.80
Muskegon,Mich., deld.	....	69.68	69.68	....
Cleveland District				
Cleveland R2, A7	62.50	63.00	63.00	63.50
Akron,O., deld.	65.25	65.75	65.75	66.25
Mid-Atlantic District				
Bethlehem,Pa. B2	64.50	65.00	65.50	66.00
NewYork, deld.	....	69.01	69.51	....
Newark,N.J., deld.	67.70	68.20	68.70	69.20
Birdsboro,Pa. B10	64.50	65.00	65.50	66.00
Chester,Pa. P4	64.50	65.00	65.50	....
Philadelphia, deld.	66.26	66.76	67.26	....
Steelton,Pa. B2	64.50	65.00	65.50	66.00
Swedeland,Pa. A3	64.50	65.00	65.50	66.00
Philadelphia, deld.	66.26	66.76	67.26	67.76
Troy,N.Y. R2	64.50	65.00	65.50	66.00
Pittsburgh District				
Nevilleisland,Pa. P6	62.50	63.00	63.00	63.50
Pittsburgh (N&S sides), Aliquippa, deld.	....	64.45	64.45	64.98
McKeesRocks,Pa. deld.	....	64.10	64.10	64.63
Lawrenceville, Homestead, Wilmerding, Monaca,Pa., deld.	....	64.76	64.76	65.29
Verona, Trafford,Pa., deld.	64.79	65.32	65.32	65.85
Brackenridge,Pa., deld.	65.10	65.60	65.60	66.13
Bessemer,Pa. U5	62.50	....	63.00	63.50
Clairton,Rankin,S.Duquesne,Pa. U5	62.50	....	....	....
Midland,Pa. C18	62.50	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malleable	Bessemer
Hubbard,O. Y1	....	....	63.00	....
Sharpsville,Pa. S6	62.50	....	63.00	63.50
Youngstown Y1	....	....	63.00	63.50
Mansfield,O., deld.	67.40	....	67.90	68.40
Duluth I-3	62.50	63.00	63.00	63.50
Erie,Pa. I-3	62.50	63.00	63.00	63.50
Everett,Mass. E1	63.25	63.75	64.25	....
Fontana,Calif. K1	70.00	70.50	....	....
Geneva,Utah C11	62.50	63.00	....	....
GraniteCity,Ill. G4	64.40	64.90	65.40	....
Ironton,Utah C11	62.50	63.00	....	....
LoneStar,Tex. L6	58.50*	59.00†	....	....
Minnequa,Colo. C10	64.50	65.00	65.50	....
Rockwood,Tenn. T3	....	59.00‡	63.00	....
Toledo,O. I-3	62.50	63.00	63.00	63.50
Cincinnati, deld.	68.26	68.76	....	....

*Phos. 0.51-0.75%; Phos. 0.31-0.50%, $59.50.
†Phos. 0.51-0.75%; Phos. 0.31-0.50%, $60.
‡Phos. 0.70-0.90%; intermediate (Phos. 0.31-0.69%), $60.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.05% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.25 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. I3, J1	71.50
Buffalo H1	72.75

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon: add $1 for each 0.5% Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$97.50
NiagaraFalls,N.Y. P15	97.50
Keokuk,Iowa, Open-hearth & Fdry, freight allowed K2	102.00
Keokuk, O.H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	105.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$76.50
Rockwood,Tenn. T3 (Phos. 0.035% max)	76.50
Steelton,Pa. B2 (Phos. 0.035% max)	70.50
Philadelphia, deld.	74.05
Troy,N.Y. R2 (Phos. 0.035% max)	70.50
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	67.50
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	67.50
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	67.50
Nevilleisland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	67.50

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: St. Paul, 25 cents; Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, San Francisco, Spokane, 10 cents; Atlanta, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS				Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Merchant Qual.	H.R. Spec. Qual.	C.F. Rds.‡	H.R. Alloy 4140††§		Carbon	Floor
Atlanta	8.07‖	9.27‖	9.83‖	....	8.16	8.30	...	10.14	....	8.44	8.40	10.22
Baltimore	7.79	8.99	9.12	....	8.27	8.34	8.87	9.09¹	15.69	8.57	8.12	10.81
Birmingham	7.68‖	8.88‖	8.85‖	....	7.78	7.91	8.44	10.04	....	8.05	8.01	10.04
Boston	8.70	9.73	11.02	....	8.79	8.88	9.43	10.71	14.46	8.90	8.98	10.39
Buffalo	7.75	8.90	10.72	....	8.00	8.00	8.70	8.70	14.30	8.25	8.25	9.80
Chattanooga	7.90‖	9.10‖	9.10‖	....	8.00	8.13	8.66	9.96	....	8.27	8.23	9.98
Chicago	7.70	8.90	9.70	....	7.78	7.91	8.44	8.35	13.95	8.05	8.01	9.26
Cincinnati	7.82	8.89	9.75	....	8.06	8.19	8.72	8.82	14.23	8.55	8.34	9.53
Cleveland	7.68	8.88	9.60	....	7.88	7.99	8.52	8.60	14.03	8.38	8.21	9.46
Denver	9.55	11.09	12.41	....	9.70	9.75	...	10.54	18.89	9.60	9.50	11.15
Detroit	7.91	9.13	10.02	....	8.10	8.18	8.71	8.68	14.19	8.55	8.33	9.49
Erie, Pa.	7.75	8.88	9.60¹⁰	....	7.90	8.00	8.65	8.70¹⁰	....	8.35	8.20	9.50
Houston	8.70	9.65	10.99	....	8.80	8.95	9.50	10.55	15.00	8.90	8.60	10.10
Jackson, Miss.	8.00‖	9.20‖	9.22‖	....	8.10	8.23	8.76	10.14	....	8.37	8.33	10.08
Los Angeles	8.90	10.65	11.65	....	9.10	8.80	9.50	11.70	15.25	8.95	9.35	11.50
Milwaukee	7.82	9.02	9.82	....	7.90	8.03	8.56	8.57	14.07	8.24	8.13	9.38
Moline, Ill.	8.05	9.25	10.05	....	8.13	8.26	...	8.70	....	7.78	8.36	...
New York	8.35	9.53	10.23	57.73	8.81	8.83	9.38	10.61	14.37	8.74	8.78	10.05
Norfolk, Va.	7.85	...	...	....	8.30	8.35	...	10.80	....	8.60	8.10	9.60
Philadelphia	7.89	9.08	10.12	....	8.58	8.37	8.90	9.12	14.15	8.38	8.28	9.37
Pittsburgh	7.68	8.88	10.05	50.00	7.88	7.91	8.44	8.60	13.95	8.05	8.01	9.26
Portland, Oreg.	8.90	9.65	11.40	....	9.05	8.95	...	13.55	14.60	8.90	8.70	11.60
Richmond, Va.	8.05	...	10.09	....	8.45	8.70	9.20	10.00	....	8.80	8.35	9.70
St. Louis	8.02	9.21	10.03	....	8.11	8.25	8.78	8.93	14.28	8.48	8.34	9.59
St. Paul	8.29	9.49	10.31	....	8.39	8.52	...	9.21	....	8.75	8.71	9.87
San Francisco	8.75	10.30	10.80	....	8.95	8.80	9.35	12.30	15.25	8.85	8.85	11.15
Seattle	9.35	11.20	11.55	....	9.50	9.30	9.85	13.15	15.55	9.15	9.05	11.25
Spokane, Wash.	9.35	11.35	11.55	....	9.50	9.30	9.85	13.15	16.30	9.15	9.05	11.25
Washington	8.37	10.57	...	....	9.06	8.92	...	9.67	....	9.15	8.70	10.14

*Prices do not include gage extras; †prices include gage and coating extras (based on 12.50c zinc at Los Angeles and 13.50c at other points), except in Birmingham (coating extra excluded); ‡includes 35-cent bar quality extras; **¼-in. and heavier; ††as annealed; ‡42 in. and under.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York and Boston, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; ⁹—400 to 999 lb; ¹—1000 to 1999 lb; ³—2000 to 3999 lb; ¹⁰—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $128; Salina, Pa., $133; Niles, O., $138; Cutler, Utah, $148.

Super-Duty: Ironton, O., Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St. Louis, $165; Stevens Pottery, Ga., $175.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, O., Hawstone, Pa., $140; Warren, Niles, Windham, O., Hays, Latrobe, Morrisville, Pa., $145; E. Chicago, Ind., Joliet, Rockdale, Ill., $150; Lehigh, Utah, $165; Los Angeles, $170.

Super-Duty: Hays, Sproul, Hawstone, Pa., Niles, Warren, Windham, O., Leslie, Md., Athens, Tex., $157; Morrisville, Latrobe, Pa., $160; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $145; Woodbridge, N. J., $128; Philadelphia, $130.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, O., $96; Clearfield, Pa., Portsmouth, O., $98.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $220; Danville, Ill., $223; Philadelphia, Clearfield, Pa., $230.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $275; Danville, Ill., $278; Philadelphia, Clearfield, Pa., $285.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $315; Danville, Ill., $318; Philadelphia, Clearfield, Pa., $325.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $177; Clearfield, Pa., $189.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $292; Clearfield, Pa., $311.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $221; Clearfield, Pa., $236.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettaville, Millersville, Martin, Woodville, O., Gibsonburg, Narlo, O., $16; Thornton, McCook, Ill., $16.35; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ¼-in. grains with fines: Chewelah, Wash., $43; Luning, Nev., $43; ⅜-in. grains with fines; Baltimore, $69.40.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $38-39; 70%, $35-36; 60%, $31-32. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $34; Mexican, $26.50.

Ores

Lake Superior Iron Ore

(Prices effective for the 1956 shipping season, gross tons, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$11.25
Old range nonbessemer	11.10
Mesabi bessemer	11.00
Mesabi nonbessemer	10.85
Open-hearth lump	12.10
High phos.	10.85

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Dec. 1, 1955, and increases or decreases after such date are for seller's account.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	25.00
N. African hematite (spot)	nom. 24.00-25.00
Brazilian iron ore, 68-69%	32.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$29.00-30.00
Domestic, scheelite, mine	55.00

Manganese Ore

Mn 48%, contracts, nominally $1.35-1.40, per long ton unit, c.i.f. U.S. ports, duty for buyer's account; 46-47%, $1.15. Spot cargoes, 10 to 15% higher.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$52.00-53.00
48% 2.8:1	nom. 49.00-50.00
48% no ratio	39.00-40.00

South African Transvaal

48% no ratio	$37.50-39.00
44% no ratio	26.00-27.00

Turkish

48% 3:1	$60.00-63.00

Domestic

Rail nearest seller

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.18

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

55-60%	$3.35-3.80
60-65%	3.80-3.90

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge iron:	
Swedish, c.i.f. Camden, N.J., c.l. in bags	8.50
Domestic:	
F.o.b., Johnstown, Pa., Niagara Falls, N. Y., in bags	9.50
F.o.b. Riverton, N.J., in bags	8.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	24.00
Annealed, 99.5% Fe	36.50
Unannealed (99+ % Fe)	34.00
Unannealed (99+ % Fe) (minus 325 mesh)	57.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron:	
98.1-99.9%, 3 to 20 microns, depending on grade, 86.00-275.00, in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atomized, 500 lb, drum frght, allowed	
Carlots	36.20
Ton lots	38.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	*36.80-46.80†*
Bronze, 5000-lb lots	*56.20-60.00†*
Copper:	
Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese:	
Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.00
Nickel-Silver, 5000-lb lots	*55.10-58.40†*
Phosphor-Copper, 5000-lb lots	*66.00*
Copper (atomized) 5000-lb lots	*48.50-56.00‡*
Silicon	47.00
Solder	7.00*
Stainless Steel, 302	99.00
Stainless Steel, 316	$1.32
Tin	14.50*
Zinc 5000-lb lots	19.75-33.00†
Tungsten:	Dollars
Melting grade, 99%	
60 to 200 mesh:	
1000 lb and over	*4.20*
Less than 1000 lb	*4.35*
Chromium, electrolytic 99.8% Cr min. metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni. **64% Cu, 18% Zn, 18% Ni.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Diam	Length	Per 100 lb
2	24	$57.75
2½	30	37.25
3	40	35.25
4	40	33.75
5⅛	40	33.00
6	60	30.00
7	60	26.75
8, 9, 10	60	26.50
12	72	25.50
14	60	25.50
16	72	24.50
17	60	25.50
18	72	24.50
20	72	24.00
24	84	24.75

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.10
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.25-14.75
Connellsville, foundry	17.00-18.00

Oven Foundry Coke

Birmingham, ovens	$27.60
Cincinnati, deld.	32.53
Buffalo, ovens	29.50
Camden, N.J., ovens	28.50
Detroit, ovens	29.50
Pontiac, deld.	31.15
Saginaw, deld.	32.73
Erie, Pa., ovens	29.50
Everett, Mass., ovens New England, deld.	30.55*
Indianapolis, ovens	28.75
Ironton, O., ovens	28.00
Cincinnati, deld.	28.25
Kearny, N.J., ovens	28.75
Lone Star, Tex., ovens	25.50
Milwaukee, ovens	29.50
Painesville, O., ovens	29.50
Cleveland, deld.	31.55
Philadelphia, ovens	28.50
St. Louis, ovens	28.50
Neville Island (Pittsburgh), Pa., ovens	28.25
St. Paul, ovens	28.50
Chicago, deld.	31.82
Swedeland, Pa., ovens	28.50
Terre Haute, Ind., ovens	28.75

*Or within $4.55 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$7.40	$7.40	$7.40	$7.65
Bar Size Angles	7.11	7.11	7.11	7.26
Structural Angles	7.50	7.50	7.50	7.80
I-Beams	7.75	7.75	7.75	8.15
Plates	9.50	9.50	9.50	10.00
Sheets, H.R.	8.55	8.55	8.55	8.85
Sheets, C.R. (drawing quality)	8.95	8.95	8.95	9.35
Furring Channels, C.R., 1000 ft. ¾ x 0.30 lb per ft	27.32	27.32	27.32	31.15
Barbed Wire (†)	6.61	6.61	6.61	6.96
Merchant Bars	7.15	7.15	7.15	7.50
Hot-Rolled Bands	7.25	7.25	7.25	7.65
Wire Rods, Thomas Commercial No. 5	6.38	6.38	6.38	6.78
Wire Rods, O-H Cold Heading Quality No. 5	6.72	6.72	6.72	7.12
Bright Common Wire Nails	7.90	7.90	7.90	8.02

Oil Country Pipe: Mills withdrawn for remainder of the year.

†Per 82-lb. net, reel. §Per 100-lb kegs, 20d nails and heavier

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Cariot, per gross ton, Palmerton, Pa. 21-23% Mn, $102; 19-21% Mn, 1-3% Si, $99.50; 16-19% Mn, $97.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $235, Johnstown, Duquesne, Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%). Lump $223 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 33.75c per lb of contained Mn, carload packed 35.05c, ton lots 36.55c, less ton 37.75c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk 24.15c per lb of contained Mn, packed, carload 25.45c, ton lot 27.05c, less ton 28.25c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 33c; 2000 lb to min carload, 35c; 500 lb to 1999 lb, 37c; 50 lb cans, 37.5c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12.95c per lb of alloy. Packed, c.l. 14.15, ton 14.60c, less ton 15.6c, f.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract ton lot 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37 f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 27.75c per lb of contained Cr; c.l. packed 29.3c, ton lot 31.05c; less ton 32.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 34.75c per lb contained Cr, 0.02% max 41.5c, 0.03% max 41c, 0.06% max 39.5c, 0.1% max 39c, 0.15% max 38.75c, 0.2% max 38.5c, 0.5% max 38.25c, 1.0% max 37.5c, 1.5% max 37.35c, 2.0% max 37.25c. Ton lot, add 3.4c, less ton add 5.1c. Carload packed add 1.75c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l. 2 in. x D, bulk 29.05c per lb contained Cr. Packed, c.l. 30.65c, ton 32.45c, less ton 33.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed 8 M x D, 20.85c, per lb of alloy, ton lot 22.10c; less ton lot 23.3c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 39-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 41.35c per lb of contained Cr; 1" x down, bulk 42.35c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ¼" thick) $1.29 per lb, ton lots $1.31; less ton lots $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1, $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed, 21.40c; ton lot 22.50c f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si. Packed, c.l. 16c, ton lot 17.45c, less ton 19.1c. F.o.b. Alloy, W. Va., Ashtabula, Marietta, O., Sheffield, Ala., and Portland, Oreg. Spot, add 0.45c.

Low Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per pound contained silicon. Packed, c.l. 17.25c, ton lot, 19.05c; less ton, 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 98% Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 2% Fe grade analyzing min 96.5% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy, ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing 2 lb of Cr). Contract, carload, bulk, 19c per lb of briquet, carload packed in box pallets 19.2c, in bags 20.1c; 3000 lb to c.l. in box pallets 20.4c; 2000 lb to c.l. in bags, 21.3c; less than 2000 lb in bags 22.2c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing 2 lb of Mn). Contract, carload, bulk 13.9c per lb of briquet, c.l. packed, pallets 14.1c, bags 15.1c; 3000 lb to c.l., pallets 15.3c; 2000 lb to c.l. bags, 16.3c, less ton 17.2c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 14.4c per lb of briquet, c.l. packed, pallets, 14.6c; bags 15.6c, 3000 lb to c.l., pallets, 15.8c; 2000 lb to c.l., bags 16.8c; less ton 17.7c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.55c per lb of briquet, packed, pallets, 7.75c; bags 8.75c; 3000 lb to c.l., pallets 9.35c; 2000 lb to c.l. bags 10.35c; less ton 11.25c. Delivered. Spot, add 0.25c. (Small size—Weighing approx. 2½ lb and containing 1 lb of Si). Carload, bulk 7.7c. Packed, pallets 7.9c; bags 8.9c; 3000 lb to c.l. pallets 9.5c; 2000 lb to c.l. bags 10.5c; less ton 11.4c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $3.15 per lb of contained W; 2000 lb W to 5000 lb W, $3.25; less than 2000 lb W, $3.37. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $4.95 per lb of contained Cb plus Ta, delivered; less ton lots $5.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.) Contract, c.l. packed ½-in. x 12 M, 19c per lb of alloy, ton lots 20.15c, less ton 21.4c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lots 20.15c; less ton lots 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lots 19.55c; less ton lots 20.8c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth and Washington, Pa., $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.

Business operations of

THE KAPLAN TRUCKING COMPANY

Cleveland, Ohio

will continue as in the past

following the passing of our late president

EDWARD H. KAPLAN

on

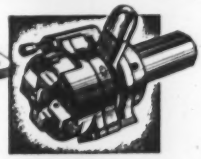
October the fifteenth

nineteen hundred and fifty-six

Your patronage, as always, will be

appreciated

H&G Insert Chaser DIE HEADS



famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

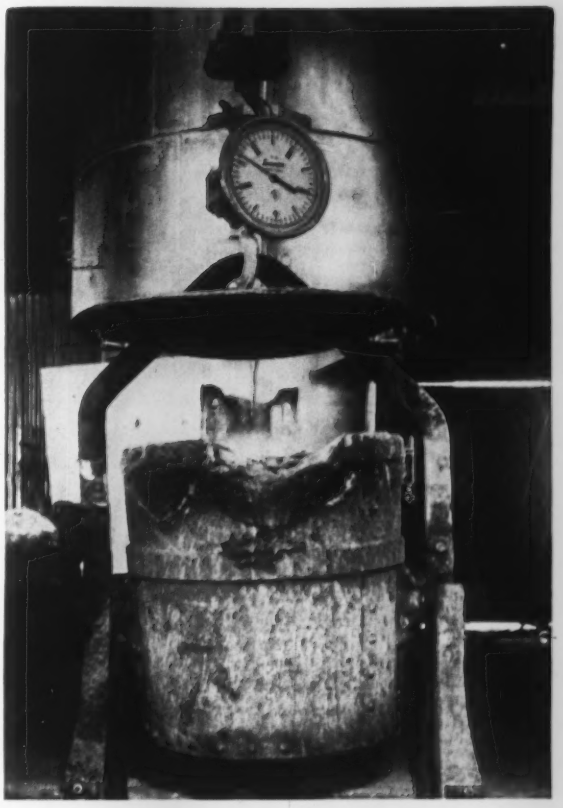
THE EASTERN MACHINE SCREW CORP., 22-42 Barclay Street, New Haven, Conn.
Pacific Coast Representative: *A. C. Berbringer, Inc., 334 N. San Pedro St., Los Angeles, California.* Canada: *F. F. Barber Machinery Co., Toronto, Canada.*

for Corrugating and Complete Line of Culvert Equipment—Slitting and Coiling Equipment for Ferrous and Non-Ferrous Material in All Capacities—Warehouse and Steel Mill Cut to Length Lines for Shearing and Levelling Sheets from Coils—Shears for Shearing Sheets and Plates Both Underdriven and Overdriven Types in Capacities to 1¼" Plate.

STAMCO, Inc., New Bremen, Ohio

★ . . . for any information about bearings and bearing metals, consult with the A. W. Cadman Mfg. Co., master makers of fine bearing metals since 1860.

PITTSBURGH	28th and Smallman Streets
PHILADELPHIA	18 W. Chelten St.
CHICAGO	Manhattan Bldg.
NEW YORK	150 Nassau St.



HOW TO POUR CASTINGS WITHOUT GUESSWORK

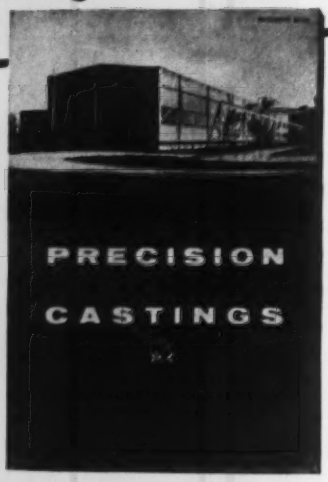
This steel foundry is using a Martin-Decker SU-20 Sensater hook scale to weigh the molten metal as it pours into the ladle. This way they use only the steel needed for pouring a specific number of castings without risking the expense of running short or having an overage. In the application pictured here, a steel, asbestos-insulated shield protects the Sensater from the intense heat.

This is but one of the hundreds of uses for the versatile Sensater, the only hydraulic crane scale accurate enough to be certified, yet rugged and compact enough to meet industry's exacting demands.

For full particulars, write Martin-Decker Corp., 3431 Cherry Ave., Long Beach 7, Calif., Dept. AJ-17.

MARTIN-DECKER CORP.
HOME OF THE WEIGHT INDICATOR — LONG BEACH, CALIFORNIA

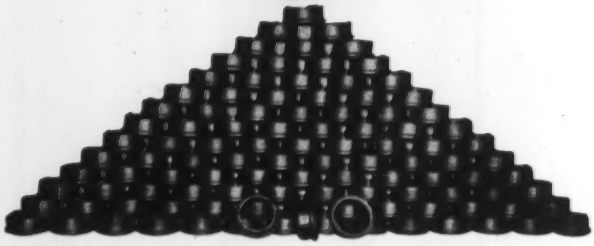
Do you require large castings of high quality?



Send for this new booklet on Chambersburg's modern foundry and the cement-bonded sand castings produced there. As a result of the accuracy and excellent quality of these castings, marked reductions in finish machining is often possible.

CHAMBERSBURG
ENGINEERING COMPANY
"THE HAMMER BUILDERS"
563 Derbyshire St. Chambersburg, Pa.

CASTINGS OF STAINLESS STEEL



Call Alloy Steel Casting Co. for heat and corrosion resistant stainless steel castings because:

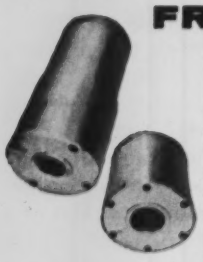
- Pattern shop with new method for making duplicate patterns without dimensional shrinkage at half the cost
- Complete heat treating facilities
- Early delivery on 2 oz. to 500 lb. stainless steel castings
- Experienced foundry engineers

Write now or call for complete information.

ASC
ALLOY STEEL CASTING CO.
Southampton, Pa. Telephone ELmwood 7-1565—1566

LA 1182

OPERATE HORIZONTAL MILLING MACHINES?



FREE DETAILS illustrate how you can increase horizontal milling machine feeds and speeds up to 200%. Jergens tapered roller bearing bushing replaces present bronze bushing at low cost without machine change. Eliminates bushing wear, cutter breakage, arbor wear, scoring and chatter. Permits use of carbide cutters to full capacity on new or old machines. Write for cost cutting facts today!

DONLEY PRODUCTS, INC.
Dept. S-11, 11106 AVON AVE., CLEVELAND, OHIO

PALMGREN Machine Vises and Rotary Tables

Used in all industries — Everywhere
There are 64 different models and types of Palmgren vises, rotary tables, milling attachments and other machine tool accessories — the most complete line of vises and tables available anywhere.

No. 608 6" Swivel Machine Vise, $99.95
Write for Catalog 204
No. 83 8" Rotary Table, $79.95

CHICAGO TOOL AND ENGINEERING CO. 8255 S. Chicago Ave., Chicago 17, Ill.

MODERN ELECTROPLATING

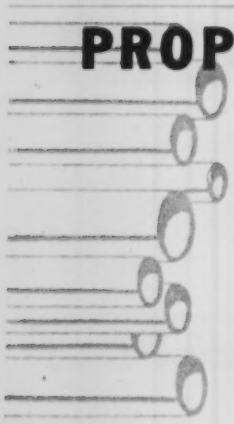
503 PAGES
ILLUSTRATED

Price $8.50 Postpaid

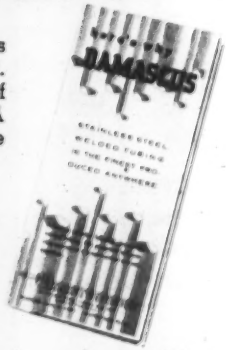
BY ALLEN G. GRAY, Technical Editor, STEEL Magazine.

Brings you a complete, up-to-date one-volume summary of current industrial electroplating processes. The only book that emphasizes both practical aspects and basic theory. The Penton Publishing Company, Book Department, 1213 West Third St., Cleveland 13, Ohio.

PROPER ANNEALING—Our Guarantee



The corrosion resistance of stainless steel pressure tubing is drastically impaired if improperly or incompletely annealed. Damascus Tube Company **guarantees complete unimpairment** of corrosion resistance in pressure tubing of its manufacture. A brochure explaining our Annealing process and our complete manufacturing story is available upon request.



DAMASCUS TUBE COMPANY
STAINLESS STEEL TUBING AND PIPE
Dept. S
Greenville, Pennsylvania

Strength Growing in Scrap

Rising prices on steelmaking grades reflect mill buying and anticipated tightening in supplies as winter nears. Upheaval in Middle East contributes to bullishness

Scrap Prices, Page 200

Philadelphia—Scrap prices are strong here. The spread on the prime grades of open-hearth material has disappeared, with No. 1 heavy melting, No. 1 bundles and No. 1 busheling now holding at the outside figure of $58, delivered. No. 2 heavy melting is strong at $48, and No. 2 bundles are higher at $47-$48.

Through an error in transmission, the Fairless Works last week was reported as having closed on the prime steel grades at $58.50, delivered. The price should have read $58.

Machine shop turnings are higher at $41, delivered, short shoveling turnings at $45, low phos structurals and plate at $64-$65, and rail crops at $79-$80.

New York—Supply and demand are in fair balance on the tonnage items of iron and steel scrap. Brokers' buying prices on these grades are unchanged. But nickel bearing stainless is strong.

Pittsburgh — Major industrial grades moved upward, with scrap suppliers under heavy pressure from the mills. The market is firm enough to cause difficulty in filling the most recent heavy melting order at $58 a ton. Pressure from the Valley is raising current quotations for No. 1 heavy melting to $59 a ton. Other grades are up $1 to $2 a ton. In the last week, the price of cut structurals averaged $70 a ton, but some sellers are asking $72. Cast iron grades declined $1 a ton on a purchase last week of No. 1 cupola at $51.

Chicago—Further firming is occurring in the scrap market here, but it is based on broker buying to fill old orders rather than consumer demand. Brokers are offering dealers $1 to $2 a ton more than a week ago, which amounts to $3 to $4 above the last mill purchases. The situation involves both industrial and dealer grades of steelmaking material. Reports are heard that brokers have been offering as high as $60 for No. 1 dealer heavy melting, $50 for No. 2 heavy melting, $61 for No. 1 dealer bundles, and $44 for No. 2 bundles. The cast grades are little affected by the stronger market tone. Railroad scrap sales are reflecting the strength.

Detroit—Entrance of local consumers into the market has been followed by an advance in scrap prices here. The increases also reflect the higher prices that were secured on the automotive lists at the end of October.

Cleveland — Prices are holding, and the market undertone continues strong. Approach of winter, when scrap collections are hampered by bad weather, and the apparent need of the mills to build stocks, are factors for strength. Assurance of high steelmaking operations through the first quarter of next year also contributes a bullish note. The explosive Middle East situation is seen as possibly increasing the pressure for scrap over coming weeks.

Cincinnati — Scrap prices have zoomed upward on strong demand, with No. 1 heavy melting now quoted $59-$60, up $3 a ton. The undertone of the market is strong.

Buffalo — The local market is firm, and dealers say it won't take much pressure to push prices higher. While area mills have not advanced buying prices, it is reported that considerable upstate New York scrap is by-passing Buffalo for Pittsburgh and Youngstown where higher prices are obtainable. Usually, when out of district buying of Buffalo area scrap is heavy, prices move up here to narrow the differential.

St. Louis — The scrap market here is strong. Little scrap is available. Advances are evident in No. 1 heavy melt, No. 1 bundles and No. 1 busheling. Rail scrap is up 50 cents to $6.

Birmingham — Principal activity here is in electric furnace grades. They display strength despite a price cut on some specialty items. Cast scrap is weak, due chiefly to a seasonal slowing down in cast pipe manufacture. No. 1 cast is off $2 a ton. Stove plate is steady.

Activity in open-hearth scrap is confined to shipments to northern mills and exports. Southern mills are out of the market.

Seattle—California scrap prices are traditionally below those quoted in the Pacific Northwest because of larger potential supplies in the South. The situation is reversed now because domestic consumption and exports from California have increased so rapidly.

YOUR BEST BUY
FOR ECONOMICAL,
DEPENDABLE SOLDERING
RUBYFLUID flux—liquid or paste—gives neat, strong unions, consistently. Wets out freely . . . fast acting . . . easy to use . . . free from objectionable fumes.

RUBY CHEMICAL CO.
75 S. McDowell Street
Columbus 8, Ohio
Rubyfluid

USER SAYS TAP LIFE UP 43% ON THIS THIN-WALLED CASTING

...thanks to
FERROCARBO®
Users everywhere report similar experiences. In fact, on 67 machining tests in 11 large machine shops, castings of gray iron treated with FERROCARBO averaged 89.5% greater machinability per tool than untreated castings. These premium castings are finer-grained, denser, stronger, yet they COST YOU NO MORE . . . because your foundryman, using FERROCARBO, makes worthwhile savings in raw material costs.
FOR FREE BOOKLET on FERROCARBO, citing actual case histories of faster machining, with longer tool life, write The Carborundum Company, Dept. 56, Niagara Falls, N.Y.
CARBORUNDUM®

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Nov. 7	$59.17
Oct. 31	58.67
Oct. Avg.	57.27
Nov. 1955	46.08
Nov. 1951	43.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*58.00-59.00*
No. 2 heavy melting	*51.00-52.00*
No. 1 bundles	*58.00-59.00*
No. 2 bundles	*48.00-49.00*
No. 1 busheling	*58.00-59.00*
Machine shop turnings	*41.00-42.00*
Mixed borings, turnings	*41.00-42.00*
Short shovel turnings	*45.00-46.00*
Cast iron borings	*45.00-46.00*
Cut structurals, 3 ft. lengths	*69.00-70.00*
Heavy turnings	*56.00-57.00*
Punchings & plate scrap	*69.00-70.00*
Electric furnace bundles	*69.00-70.00*

Cast Iron Grades

No. 1 cupola	*50.00-51.00*
Heavy breakable cast	*48.00-49.00*
Unstripped motor blocks	*35.00-36.00*
No. 1 machinery cast	*57.00-58.00*

Railroad Scrap

No. 1 R.R. heavy melt.	67.00-68.00
Rails, 2 ft and under	80.00-81.00
Rails, 18 in. and under	81.00-82.00
Rails, random lengths	79.00-80.00
Railroad specialties	73.00-74.00

Stainless Steel Scrap

18-8 bundles & solids	470.00-510.00
18-8 turnings	380-00.400.00
430 bundles & solids	110.00-120.00
430 turnings	80.00-85.00

CLEVELAND

No. 1 heavy melting	64.50-65.50
No. 2 heavy melting	50.00-51.00
No. 1 bundles	64.50-65.50
No. 2 bundles	44.00-45.00
No. 1 busheling	64.50-65.50
Machine shop turnings	35.00-36.00
Mixed borings, turnings	38.00-39.00
Short shovel turnings	38.00-39.00
Cast iron borings	38.00-39.00
Cut foundry steel	59.00-60.00
Low phos.	65.50-66.50
Cut structural plates 2 ft and under	71.00-72.00
Alloy free, short shovel turnings	43.00-44.00
Electric furnace bundles	65.50-66.50

Cast Iron Grades

No. 1 cupola	58.00-59.00
Charing box cast	51.00-52.00
Heavy breakable cast	49.00-50.00
Stove plate	55.00-56.00
Unstripped motor blocks	37.00-38.00
Brake shoes	45.00-46.00
Clean auto cast	57.00-58.00
Burnt cast	44.00-45.00
Drop broken machinery	60.00-61.00

Railroad Scrap

No. 1 R.R. heavy melt.	68.00-69.00
R.R. malleable	73.00-74.00
Rails, 2 ft and under	86.00-87.00
Rails, 18 in. and under	87.00-88.00
Rails, random lengths	83.00-84.00
Cast steel	72.00-73.00
Railroad specialties	77.00-78.00
Uncut tires	76.00-77.00
Angles, splice bars	78.00-79.00
Rails, rerolling	85.00-86.00

Stainless Steel

(Broker' buying prices; f.o.b. shipping point)

18-8 bundles, solids	450.00-500.00
18-8 turnings	300.00-310.00
430 clips, bundles, sclids	115.00-120.00
430 turnings	55.00-65.00

YOUNGSTOWN

No. 1 heavy melting	66.00-67.00
No. 2 heavy melting	57.00-58.00
No. 1 bundles	66.00-67.00
No. 2 bundles	49.00-50.00
No. 1 busheling	66.00-67.00
Machine shop turnings	36.00-37.00
Short shovel turnings	43.00-44.00
Cast iron borings	41.00-42.00
Low phos.	68.50-69.50
Electric furnace bundles	68.50-69.50

Railroad Scrap

No. 1 R.R. heavy melt.	66.00-67.00

CHICAGO

No. 1 heavy melting	59.00-63.00
No. 2 heavy melting	*49.00-50.00*
No. 1 factory bundles	65.00-66.00
No. 1 dealer bundles	*60.00-61.00*
No. 2 bundles	43.00-44.00
No. 1 busheling	59.00-63.00
Machine shop turnings	37.00-38.00
Mixed borings, turnings	39.00-40.00
Short shovel turnings	39.00-40.00
Cast iron borings	39.00-40.00
Cut structurals, 3 ft	67.00-68.00
Punchings & plate scrap	68.00-69.00

Cast Iron Grades

No. 1 cupola	50.00-51.00
Stove plate	46.00-47.00
Unstripped motor blocks	39.00-40.00
Clean auto cast	55.00-56.00
Drop broken machinery	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt.	64.00-65.00
R.R. malleable	70.00-71.00
Rails, 2 ft and under	82.00-83.00
Rails, 18 in. and under	83.00-84.00
Angles, splice bars	75.00-76.00
Rails, rerolling	87.00-88.00

Stainless Steel Scrap

18-8 bundles & solids	505.00-515.00
18-8 turnings	355.00-375.00
430 bundles & solids	105.00-110.00
430 turnings	60.00-65.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*59.00*
No. 2 heavy melting	*50.00*
No. 1 bundles	*60.00*
No. 2 bundles	*40.00*
No. 1 busheling	*59.00*
Machine shop turnings	31.00
Mixed borings, turnings	33.00
Short shovel turnings	34.00
Punchings & plate scrap	*64.00-65.00*

Cast Iron Grades

No. 1 cupola	48.00
Charging box cast	41.00
Stove plate	42.00
Heavy breakable	41.00
Unstripped motor blocks	32.00
Clean auto cast	53.00
Malleable	52.00

BIRMINGHAM

No. 1 heavy melting	42.00-43.00
No. 2 heavy melting	40.00-41.00
No. 1 bundles	42.00-43.00
No. 2 bundles	34.00-35.00
No. 1 busheling	42.00-43.00
Cast iron borings	25.00-26.00
Short shovel turnings	*35.50-36.50*
Machine shop turnings	*34.50-35.50*
Bar crops and plate	59.00-60.00
Structural & plate, 2 ft.	57.00-58.00
Electric furnace bundles	52.00-53.00
Cut foundry steel	50.00-51.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	*51.00-52.00*
Stove plate	51.00-52.00
Unstripped motor blocks	*44.00-45.00*
Charging box cast	40.00-41.00
No. 1 wheels	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	56.00-57.00
Rails, 18-in. and under	74.00-75.00
Rails, rerolling	77.00-78.00
Rails, random lengths	69.00-70.00
Angles, splice bars	*66.00-67.00*

PHILADELPHIA

No. 1 heavy melting	*58.00*
No. 2 heavy melting	48.00
No. 1 bundles	*58.00*
No. 2 bundles	*47.00-48.00*
No. 1 busheling	*58.00*
Electric furnace bundles	60.00
Mixed borings, turnings	41.00
Machine shop turnings	*41.00*
Short shovel turnings	*45.00*
Heavy turnings	53.00
Structurals & plates	*64.00-65.00*
Couplers, springs, wheels	70.00
Rails crops, 2 ft & under	*79.00-80.00*

Cast Iron Grades

No. 1 cupola	52.00-54.00
Malleable	68.00†
Heavy breakable cast	56.00-57.00
Drop broken machinery	58.00-59.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	52.00-53.00
No. 2 heavy melting	42.00-43.00
No. 1 bundles	52.00-53.00
No. 2 bundles	40.00-41.00
Machine shop turnings	31.00-32.00
Mixed borings, turnings	31.00-32.00
Short shovel turnings	37.00-38.00
Low phos. (structural & plate)	54.00-55.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Unstripped motor blocks	36.00-37.00
Heavy breakable	48.00-49.00

Stainless Steel

18-8 sheets, clips, solids	475.00-485.00
18-8 borings, turnings	*300.00-325.00*
430 sheets, clips, solids	115.00-120.00
410 sheets, clips, solids	105.00-110.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*49.00-50.00*
No. 2 heavy melting	*37.50-38.50*
No. 1 bundles	*49.00-50.00*
No. 2 bundles	*36.00-36.50*
No. 1 busheling	*49.00-50.00*
Machine shop turnings	29.00-30.00
Mixed borings, turnings	31.00-32.00
Short shovel turnings	32.00-33.00
No. 1 cast	44.50-45.50
Mixed cupola cast	*41.00-42.00*
No. 1 machinery cast	*46.00-47.00*

BUFFALO

No. 1 heavy meltin	57.00-58.00
No. 2 heavy melting	44.00-45.00
No. 1 bundles	57.00-58.00
No. 2 bundles	41.00-42.00
No. 1 busheling	57.00-58.00
Mixed borings, turnings	34.00-35.00
Machine shop turnings	31.00-32.00
Short shovel turnings	35.00-36.00
Cast iron borings	34.00-35.00
Low phos.	60.00-61.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	49.00-50.00
No. 1 machinery	54.00-55.00

Railroad Scrap

Rails, random lengths	71.00-72.00
Rails, 3 ft and under	77.00-78.00
Railroad specialties	68.00-69.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*59.00-60.00*
No. 2 heavy melting	*49.00-50.00*
No. 1 bundles	*59.00-60.00*
No. 2 bundles	*43.00-44.00*
No. 1 busheling	*59.00-60.00*
Machine shop turnings	*39.00-40.00*
Mixed borings, turnings	*37.50-38.50*
Short shovel turnings	*42.00-43.00*
Cast iron borings	*37.50-38.50*
Low phos. 18 in.	*64.00-65.00*

Cast Iron Grades

No. 1 cupola	48.00-49.00
Heavy breakable cast	47.00-48.00
Charging box cast	48.00-49.00
Drop broken machinery	58.00-59.00

Railroad Scrap

No. 1 R.R. heavy melt.	*63.00-64.00*
Rails, 18 in. and under	*79.00-80.00*
Rails, random lengths	*69.00-70.00*

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*55.00*
No. 2 heavy melting	45.00
No. 1 bundles	*55.00*
No. 2 bundles	41.00
No. 1 busheling	*55.00*
Machine shop turnings	32.00
Short shovel turnings	36.00

Cast Iron Grades

No. 1 cupola	50.00
Charging box cast	43.00
Heavy breakable cast	43.00
Unstripped motor blocks	43.00
Brake shoes	51.00
Clean auto cast	53.00
Stove plate	43.50

Railroad Scrap

No. 1 R.R. heavy melt.	*63.00*
Rails, 18 in. and under	*81.00*
Rails, rerolling	*88.00*
Rails, random lengths	*80.00*
Angles, splice bars	*67.00*

SEATTLE

No. 1 heavy melting	*54.00-55.00*
No. 2 heavy melting	*51.00-52.00*
No. 1 bundles	*51.00-52.00*
No. 2 bundles	*31.00-33.00*
Machine shop turnings	28.00-30.00
Mixed borings, turnings	28.00-30.00
Electric furnace No. 1	60.00-65.00

Cast Iron Grades

No. 1 cupola	50.00-52.00
Heavy breakable cast	48.00-50.00
No. 1 wheels	37.00
Unstripped motor blocks	48.00-50.00
Stove plate (f.o.b. plant)	40.00-42.00

LOS ANGLES

No. 1 heavy melting	57.00
No. 2 heavy melting	54.00
No. 1 bundles	55.00
No. 2 bundles	47.00
Machine shop turnings	32.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	60.00

SAN FRANCISCO

No. 1 heavy melting	55.00
No. 2 heavy melting	52.00
No. 1 bundles	53.00
No. 2 bundles	43.00
Machine shop turnings	35.00
Mixed borings, turnings	35.00
Cast iron borings	35.00
Heavy turnings	35.00
Short shovel turnings	38.00
Cut structurals	62.00

Cast Iron Grades

No. 1 cupola	60.00
Charging box cast	45.00-47.00
Stove plate	48.00
Heavy breakable cast	42.00
Unstripped motor blocks	50.00
Clean auto cast	60.00
No. 1 wheels	48.00
Drop broken machinery	60.00

HAMILTON, ONT.

No. 1 heavy melting	52.00
No. 2 heavy melting	47.00
No. 1 bundles	52.00
No. 2 bundles	40.50
Mixed steel scrap	46.00
Busheling, new factory: Prepared	50.00
Unprepared	46.00
Short steel turnings	35.00

Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b., Hamilton, Ont.

Leaders in Iron & Steel Scrap Since 1889

For over half a century our experience, personnel, equipment and key office locations have contributed to the steady growth of the iron and steel industry. Possibly our facilities may help you solve a problem in iron or steel scrap—no matter how big or small.

Luria Brothers and Company, Inc.

main office PHILADELPHIA NATIONAL BANK BUILDING, Phila. 7, Pa.

PLANTS

OFFICES

November Market Picks Up

Fourth quarter demand for nonferrous metals begins to show new strength as brass mills, zinc and aluminum diecasters receive orders from motordom

Nonferrous Metal Prices, Pages 204 & 205

LAST week's election slowed sales of nonferrous metals momentarily, but producers are beginning to glow with optimism as they watch them climb. December should be a near record month for most nonferrous metals.

Aluminum—Sales are on a high plane. Most aluminum officials continue to watch the 1957 automobile lines to see how much of the lightweight metal is being used. Look for the average 1957 model to have about 55 lb of aluminum. (The figure won't be determined until after the first of the year.)

Aluminum diecasters are picking up substantial tonnages as the first big push gets under way in Detroit. Outlook: While there will be some extra aluminum available through the rest of this year, aluminum sales will reach peak levels by December.

Copper — Anaconda Co. voiced a strong vote of confidence for the future of copper last week. Its subsidiary, Andes Copper Mining Co., outlined an expanded plan for mining and beneficiating the ores at its El Salvador mine project near Potrerillos, Chile. Its original plan (which has been approved by Chile) called for expenditure of $52.9 million. Anaconda now intends to spend $80.1 million.

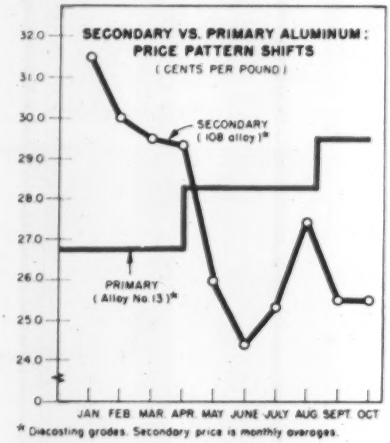
Reason: Exploration drilling and tunneling have shown that there are at least 200 million tons of ore averaging 1.6 per cent copper. Earlier surveys indicated there were only some 78 million tons which averaged 1.6 per cent. Of the total proposed expenditure, $33.8 million would be spent in Chile. The remainder would go outside that country for machinery and supplies. Anaconda estimates that full production under the new plan could be realized by the end of 1959. Point of interest: Other copper producers will announce expanded mining operations in year-end forecasts.

Brass mills are beginning to show some signs of life. With elections over and automotive demand starting to mushroom, look for brass mills to be in full swing by the end of November.

Lead, Zinc — Lead sales gained additional strength and spurted ahead during the week. Foreign demand for lead and lead products jumped as war nerves reached a fever pitch on the continent. Domestic users continue to use substantial tonnages.

Most producers of zinc are coming within 10 to 15 per cent of reaching their estimated sales goals for November. December is beginning to shape up as a peak month. There is still some extra special high grade on the market, but growing automotive demand for diecastings could eat up this inventory by the year's end. Galvanizers are buying heavy tonnages, helping to keep the price firm at 13.50 cents a pound.

Tin — Demand is on a hand-to-mouth basis. Reason: An unrealistic price (about $1.11 a pound) is forcing users to order only enough to meet immediate needs. Scheduled tin shipments are arriving in this country on time. Most shipping companies have eliminated some ports of call, making it possible for their vessels to go around the Cape of Good Hope and still arrive at U.S. ports on schedule.



* Diecasting grades. Secondary price is monthly averages.

NONFERROUS PRICE RECORD

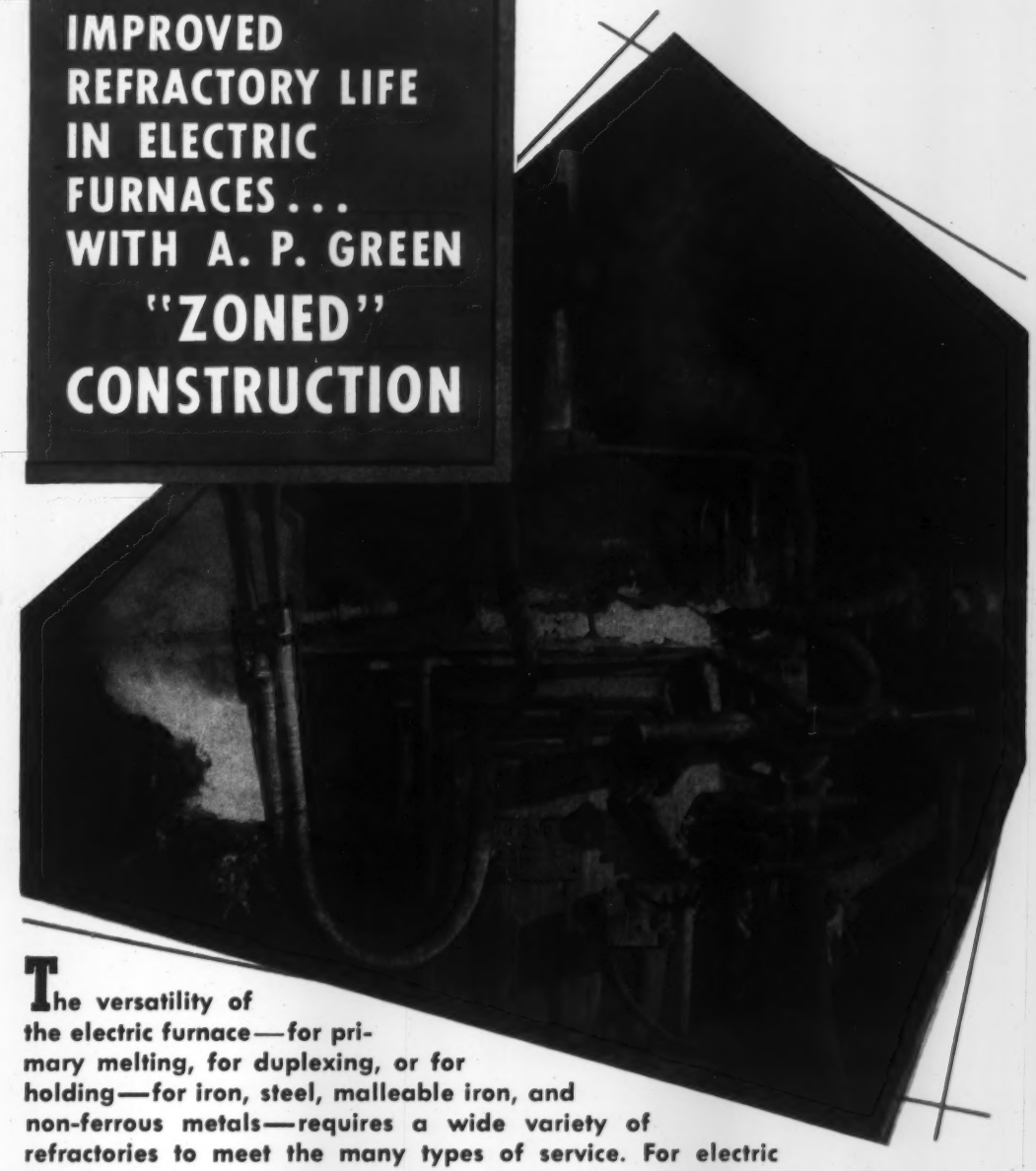
	Price Nov. 3	Last Change	Previous Price	Sept. Avg.	Aug. Avg.	Oct., 1955 Avg.
Copper	36.00	Oct. 31, 1956	35.00–36.00	39.500	39.750	44.594
Lead	15.80	Jan. 13, 1956	16.30	15.800	15.800	15.300
Zinc	13.50	Jan. 6, 1956	13.00	13.500	13.500	13.020
Tin	110.00	Nov. 5, 1956	112.375	103.745	99.043	96.230
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	64.500
Aluminum	27.10	Aug. 10, 1956	25.90	27.100	26.700	24.400
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	34.694	32.500

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.

Market Memos

- Primary magnesium ingot production reached 6128 tons in September. Fourth quarter production should reach this capacity figure each month. The nine-month total shows that this year's production, which was hampered by a serious strike in the third quarter, is ahead of the 1955 total by 13 per cent (47,709 tons vs. 42,458 tons).
- Says Joseph A. Martino, president, National Lead Co.: "This year's production of titanium sponge may approach 15,000 tons. Production of 30,000 tons in 1957 could be supported by forecasts of market demands, but output probably won't reach that figure."

IMPROVED REFRACTORY LIFE IN ELECTRIC FURNACES... WITH A. P. GREEN "ZONED" CONSTRUCTION



The versatility of the electric furnace—for primary melting, for duplexing, or for holding—for iron, steel, malleable iron, and non-ferrous metals—requires a wide variety of refractories to meet the many types of service. For electric furnace roofs, A. P. Green super duty brick, high alumina brick, and monolithic refractories have performed outstandingly in many applications. Even in a specific installation, the service life of a roof may often be materially increased by the judicious combination of several types of refractories. Such "zoned" construction offers maximum economy.

For detailed information on service and specific recommendations —contact your local A. P. Green Representative or write

A. P. Green REFRACTORY PRODUCTS

A. P. GREEN FIRE BRICK CO.

Mexico, Missouri, U. S. A.
Plants: Mexico, Mo.—Woodbridge, N. J.
Sulphur Springs, Texas
In Canada: A. P. GREEN FIRE BRICK COMPANY, LTD.
Toronto 15, Ontario

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots, 27.10; pigs, 25.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.90; No. 43, 28.70; No. 195, 30.30; No. 13, 28.90; No. 43, 28.70; 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $4.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 36.00 deld. Conn. valley; 36.00 deld. Midwest; custom smelters, 36.00 deld.; lake, 36.00 deld.; fire refined, 35.75 deld.

Germanium: First reduction, $201.85-$220 per lb; intrinsic grade, $220-$242.67 per lb, depending on quantity.

Gold: U.S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-$110 nom. per troy oz.

Lead: Common, 15.80; chemical, 15.90; corroding, 15.90, St. Louis. New York basis, add 0.20.

Lithium: 98 +%, cups or ingots, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: Pig, 35.25; ingot, 36.00, f.o.b. Velasco, Tex. 13 in. sticks, 59.00, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91B (diecasting), 37.25 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $253-$255 per 76-lb flask.

Molybdenum: Extruded ingot, $9.60 per pound, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 64.50; 10-lb pigs, die-packed, 67.65; "XX" nickel shot, 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $80-$100 per troy oz, nom.

Palladium: $23-24 per troy oz.

Platinum: $103-$108 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $13.50-$15 per lb.

Silver: Open market, 91.375 per troy oz.

Sodium: 16.50, c.l.; 17.00, l.c.l.

Tantalum: Sheet, rod, $68.70 per lb; powder, $56.63 per lb.

Tellurium: $1.50-$1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot, 110.00; prompt, 109.75.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max), $3.00; grade A-2 (0.5% Fe max), $2.70 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $4.50 per lb, nom, f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $5. Treated ingot, $6.70.

Zinc: Prime Western, 14.00; brass special, 14.25; intermediate, 14.00, East St. Louis, freight allowed over 0.50 per pound. High grade 14.85; special high grade, 15.25 deld. Diecasting alloy ingot No. 3, 18.00; No. 2, 19.00; No. 5, 18.50, deld.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, commercial grade, $10 per lb; reactor grade, $14-$22 per lb, depending on quantity. Powder electronics grades, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 25.25-30.00; No. 12 foundry alloy (No. 2 grade), 23.50-24.50; 5% silicon alloy, 0.60 Cu max, 24.00-26.25; 13 alloy, 0.60 Cu max, 26.00-26.25; 195 alloy, 26.00-26.50; 108 alloy, 24.00-26.25. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.75; grade 2, 23.00, grade 3, 22.25; grade 4, 21.75.

Brass Ingot: Red brass, No. 115, 35.00; tin bronze, No. 225, 46.00; No. 245, 41.50; high-leaded tin bronze, No. 305 38.50; No. 1 yellow, No. 405, 27.50; manganese bronze, No. 421, 30.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 37.50; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nominal 1.9% Be alloy). Strip, $1.86-$1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.88, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 41.355; l.c.l, 41.98. Weatherproof, 30,000-lb lots, 40.78; l.c.l., 41.53. Magnet wire deld., 15,000 lb or more, 48.68; l.c.l., 49.43.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more, $21.50 per cwt; pipe, full coils, $21.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheet and strip, $12.10-$13.00; sheared mill plate, $10.50-$12.00; wire, $9.50-$11.50; forging billets, $7.25-$7.50; hot-rolled and forged bars, $7.55-$7.80.

ZINC

(Prices per lb, c.l. f.o.b. mill) Sheets, 24.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $20.35; H.R. strip, $23.95; C.R. strip, $32.00; forged or H.R. bars, $18.40; wire, 0.015 in., 8.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	113	97	118
Strip, C. R.	111	99	128
Plate H.R.	107	96	111
Rod, Shapes, H.R.	94	80	99
Seamless Tubes	144	120	190

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed)

Thickness Range, Inches	Flat Sheet	Coiled Sheet
0.249-0.138	40.90-45.40	....
0.135-0.096	41.40-46.50	37.70-39.60
0.095-0.077	42.10-48.30	37.80-39.80
0.076-0.061	42.70-50.60	38.20-40.50
0.060-0.048	43.40-52.90	38.80-41.50
0.047-0.038	43.90-55.60	39.60-42.90
0.037-0.030	44.30-50.00	40.40-44.70
0.029-0.024	44.90-52.40	41.00
0.023-0.019	45.80-52.20	42.00
0.018-0.017	46.60-53.30	42.60
0.016-0.015	47.50-53.90	43.40
0.014	48.50-50.90	44.40
0.013-0.012	49.70-52.10	45.10
0.011	50.70-53.70	46.30
0.010-0.0095	52.10-54.40	47.60
0.009-0.0085	53.40	49.10
0.008-0.0075	55.00	50.03
0.007	56.50	51.80
0.006	58.10	53.20

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	40.2	44.5
5050-F	41.3	45.6
3004-F	42.3	47.5
5052-F	42.9	48.2
6061-T6	44.4	50.0
2024-T4*	48.1	54.4
7075-T6*	55.4	62.5

*24-48 in. widths or diam, 72-180 lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	74.30	71.50	....	....
0.156-0.172	63.00	60.40	....	....
0.188	63.00	60.40	....	76.40
0.219-0.234	59.70	57.20	....	....
0.250-0.281	59.70	57.20	....	73.00
0.313	59.70	57.20	....	69.60
0.344	58.50	....	....	....
Cold-finished				
0.375-0.547	58.80	57.50	70.10	65.50
0.563-0.688	58.80	57.50	66.70	61.60
0.750-1.000	57.40	56.00	61.00	58.10
1.063	57.40	56.00	....	56.10
1.125-1.500	55.20	53.90	59.00	56.10
Rolled				
1.563	53.70	52.40	....	....
1.625-2.000	53.10	51.60	....	....
2.125-2.500	51.70	50.30	....	....
2.563-3.375	50.20	48.70	....	....

Forging Stock: Round, Class 1, 43.30-55.90 in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 48.10-63.20 in random lengths, 0.375-4 in. thick width 0.750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
⅜	$18.45	2	$ 57.00
1	29.00	4	157.20
1¼	39.25	6	281.65
1½	46.95	8	423.80

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	45.90-47.50	61.50-65.80
12-14	46.20-47.70	62.20-66.80
15-17	46.40-48.30	63.50-68.50
18-20	47.00-48.80	65.50-71.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; 0.81 in., 77.90; 125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.0, 93.30. Thread plate, .188 in., 71.70; .250-2.0 in., 70.60. Tooling plate, .250-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 13.50-14.00; old sheets, 10.50-11.00; borings and turnings, 7.50-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	57.63b	54.86c	....	57.82	32.000	32.000	31.250
Yellow Brass	49.44	40.17d	49.98	52.35	24.625	24.375	22.625
Low Brass, 80%	52.65	52.59	53.19	55.46	27.375	27.125	26.625
Red Brass, 85%	53.79	53.73	54.33	56.60	28.500	28.250	27.750
Com. Bronze, 90%	55.48	55.42	56.02	58.04	29.500	29.250	28.750
Manganese Bronze	57.13	51.23	61.47	....	23.000	22.750	22.250
Muntz Metal	51.44	47.25	....	....	23.125	22.875	22.375
Naval Brass	53.39	47.70	60.45	56.55	23.000	22.750	22.250
Silicon Bronze	61.44	60.63	61.48	63.36	31.250	31.000	30.250
Nickel Silver, 10%	65.16	69.20g	67.49	....	30.125	29.875	15.063
Phos. Bronze, A, 5%	76.25	76.75	76.75	77.93	33.000	32.750	31.750

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded

8.00; crankcases, 10.50-11.00; industrial castings, 10.50-11.00.

Copper and Brass: No. 1 heavy copper and wire, 27.50-28.00; No. 2 heavy copper and wire, 26.00-26.50; light copper, 23.50-24.00; No. 1 composition red brass, 24.50-25.00; No. 1 composition turnings, 23.50-24.00; yellow brass turnings, 13.50-14.00; new brass clippings, 20.50-21.00; light brass, 14.00-14.50; heavy yellow brass, 15.50-16.00; new brass rod ends, 18.00-18.50; auto radiators, unsweated, 17.50-18.00; cocks and faucets, 18.00-18.50; brass pipe, 19.00-20.00.

Lead: Heavy, 12.50-13.00; battery plates, 7.00-7.25; linotype and stereotype, 13.00-14.00; electrotype, 12.50-13.00; mixed babbitt, 13.00-14.50.

Monel: Clippings, 80.00-90.00; old sheets, 70.00-80.00; turnings, 70.00-80.00; rods, 80.00-90.00.

Nickel: Sheets and clips, 130.00-195.00; rolled anodes, 130.00-195.00; turnings, 110.00-165.00; rod ends, 130.00-195.00.

Zinc: Old zinc, 4.50-5.50; new die-cast scrap, 4.00-4.50; old die-cast scrap, 2.50-3.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 18.00-19.00; 3003 clippings, 18.00-19.00; 6151 clippings, 18.00-19.00; 5052 clippings, 18.00-18.50; 2014 clippings, 17.00-18.50; 2017 clippings, 17.00-18.50; 2024 clippings, 17.00-18.50; mixed clippings, 17.00-17.50; old sheets, 15.50-16.00; old cast, 15.50-16.00; clean old cable (free of steel), 18.00; borings and turnings, 15.75-16.75.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 58.00; light scrap, 54.00; turnings and borings, 38.00.

Copper and Brass: No. 1 heavy copper and wire, 30.50; No. 2 heavy copper and wire, 29.00; light copper, 26.75; refinery brass (60% copper) per dry copper content, 27.50.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 30.50; No. 2 heavy copper and wire, 29.00; light copper, 26.75; No. 1 composition borings, 26.50-27.00; No. 1 composition solids, 27.00-27.50; heavy yellow brass solids, 19.00-19.50; yellow brass turnings, 17.50; radiators, 20.50-21.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 54.29; oval, 53.42, 5000-10,000 lb; electrodeposited, 45.78; 2000-5000 lb lots; cast, 48.04, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, $1.015; 10-499 lb, 99.50; 500-4999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab; less than 200 lb, 128.50; 200-499 lb, 127.00; 500-999 lb, 126.50; 1000 lb or more, 126.00.

Zinc: Balls, 21.00; flat tops, 21.00; flats, 22.75; ovals, 22.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb, in 100-lb drums.
Chromic Acid: Less than 10,000 lb, 30.25, over 10,000 lb, 29.50.

Copper Cyanide: 100-1000 lb, 80.50.
Copper Sulphate: 500-1900 lb, 21.15; 2000 lb and over, 18.65.

Nickel Chloride: 10 lb, 46.50; 200 lb, 44.50; 300 lb, 43.50; 400-4900 lb, 41.50; 5000-9900 lb, 39.50; 10,000 lb and over, 38.50. Prices eastern delivery.

Nickel Sulphate: 100 lb, 38.25; 200 lb, 36.25; 300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 lb, 31.25; 36,000 lb, 30.35. Prices eastern delivery.

Sodium Cyanide: Egg, under 1000 lb, 19.80; 1000-19,900 lb, 18.80; 20,000 lb and over, 17.80; granular, add 1-cent premium to above.
Sodium Stannate: Less than 100 lb, 76.20; 100-600 lb, 67.40; 700-1900 lb, 64.90; 2000-9900 lb, 63.20; 10,000 lb or more, 62.00.

Stannous Chloride (anhydrous): Less than 25 lb, 174.40; 25 lb, 139.40; 100 lb, 124.40; 400 lb, 122.00; 5200-19,600 lb, 109.80; 20,000 lb or more, 97.60.

Stannous Sulphate: Less than 50 lb, 136.80; 50 lb, 106.80; 100-1900 lb, 104.80; 2000 lb or more, 102.80.

Zinc Cyanide: Under 1000 lb, 55.55; 1000 lb and over, 53.55.

INDUSTRIAL ENGINEERS

Career opportunities are available for qualified men with at least two (2) years experience in Time Study for Incentive Development, Methods Analysis and/or Standard Cost. Background of steel operations desirable. Interview and relocation allowances. Prompt consideration will be given all replies. Submit resume to:

PERSONNEL DIRECTOR
GREAT LAKES STEEL CORPORATION
Ecorse, Detroit 29, Mich.

FOUNDRY SUPERINTENDENT

Must have several years of steel foundry experience. Will exercise supervisory and quality control over a new foundry producing molds, stools, and other castings for in-plant use. Excellent opportunity. Liberal salary and bonus. Please submit resume, including education, experience, and salary requirements.

SUPERVISOR OF EMPLOYMENT
GRANITE CITY STEEL COMPANY
GRANITE CITY, ILLINOIS

WE CAN HELP YOU TO CONTACT high calibre men to fill specific jobs you have in mind—
Readers of STEEL include men of wide training and experience in the various branches of the metalworking industry.
When you have an opportunity to offer, use the Help Wanted columns of STEEL.

CLASSIFIED

Positions Wanted

STEEL PLANT MANAGER

- Open Hearth & Electric Furnaces.
- Plant Design—Blooming—Slabbing—continuous billet mills—strip—bar—structural—merchant and continuous rod mills.
- Redesign present installation and put into operation including roll design to improve quality and increase production.
- Impressive complete steel background—Research and development of stainless and alloy steels.
- 30 years operational & engineering experienced in all phases.

Write Box 485, STEEL, Penton Bldg., Cleveland 13, Ohio.

WORKS MANAGER

Age 41 with 21 years experience in all phases of heavy and light steel fabrication. Technical, administrative, managerial and industrial relations. Seeks position as Works, Production or Plant Manager. Will relocate. Compensation approximately $15,000. Write Box 489, STEEL, Penton Bldg., Cleveland 13, Ohio.

STEEL CASTINGS SALESMAN. Experienced selling carbon, alloy, stainless castings. N.J. N.Y. Young, aggressive, personable. Consider steel m'fr, warehouse, related fields. Write Box 488, STEEL, Penton Bldg., Cleveland 13, Ohio.

FERROUS METALLURGIST: TWENTY YEARS experience in steel-making, rolling, processing and inspection. Location unimportant. Write Box 486, STEEL, Penton Bldg., Cleveland 13, Ohio.

CLASSIFIED RATES

All classifications other than "Positions Wanted" set solid. 50 words or less $15.00, each additional word .30; all capitals, 50 words or less $19.20, each additional word .38; all capitals leaded, 50 words or less $23.40, each additional word .47. "Positions Wanted" set solid, 25 words or less $3.60, each additional word .14; all capitals, 25 words or less $4.50, each additional word .18; all capital leaded, 25 words or less $5.40, each additional word .22. Keyed address takes seven words. Cash with order necessary on "Positions Wanted" advertisements. Replies forwarded without charge. Displayed classified rates on request. Address your copy and instructions to STEEL, Penton Building, Cleveland 13, Ohio.

FOR SALE OR RENT

2—100-ton capacity steel Gin Poles, 112' 8" high. Boxing 48" square, corner angles 4 x 4 x ½", with 27'6½" balance beam. Weight 31,000 #.
1—American Terry Model 175 Steel Erectors Guy Derrick, 85' mast, 75' boom. Rated 15-ton @ 30' radius.
2—Lambert 4/D Steam Hoists, 12¼" x 16". Rated 30,000 # LP.
1—Lambert 3/D Steam Hoist, 12¼" x 16". Rated 30,000 # LP with or without boilers.
Write for New Stock List No. 456

EQUIPMENT CORPORATION OF AMERICA
CLIFTON HEIGHTS, PA., Box 608A
PITTSBURGH 30, PA., Box 933A
CHICAGO 4, ILL., 327-A S. LaSalle St.
NEW YORK 7, N. Y., 30A Church St.

FROM STOCK
IMMEDIATE SHIPMENT
STRUCTURAL WIDE FLANGE BEAMS ASTM-A-7
400 TONS 10" x 5¾" x 21# x 40'
200 TONS 12" x 6½" x 27# x 40'
PRICE: $12.60 per cwt., net
All Extras Included
FOR QUICK ACTION
WRITE OR WIRE
Box 476, STEEL
Penton Bldg. Cleveland 13, Ohio

IMMEDIATE DISPOSAL
Overhead Bridge Cranes
All 3 Motor, Cab Operated, 230 volt D.C.
2—15 Ton Morgan and P&H, 71'-10" Span.
1—15 Ton P&H, 48'-9" Span.
1—10 Ton P&H, 38'-9" Span.
Diesel Generators
2—200 KW F.M. 300 H.P., 257 RPM, 240 Volt.
1—200 KW Worthington 300 H.P., 400 RPM, 240 Volt.
Miscellaneous
1—BG1 Pratt & Whitney Kellering Machine.
1—72" x 52'-4" Niles Lathe, 2-Carriage, 50 H.P. Motor, Rapid Traverse.
1—160 Ton, W-S, Horiz. Hydr. Forcing Press, complete with Pumps.
CONSOLIDATED PRODUCTS CO., INC.
59 Garden St. Hoboken, N. J.
HO 3-4425 N. Y. Tel: BA 7-0600

FOR SALE
Disposing of our idle machine tools. Write for brief list of Planers, Milling Machines, Hand Brakes, Drills, Shapes, Turbo-Generators, Motor-Generators, ETC.
CONTACT: E. Wilmoth
New York Shipbuilding Corp.
Camden, New Jersey
Telephone: WOodlawn 3-6700

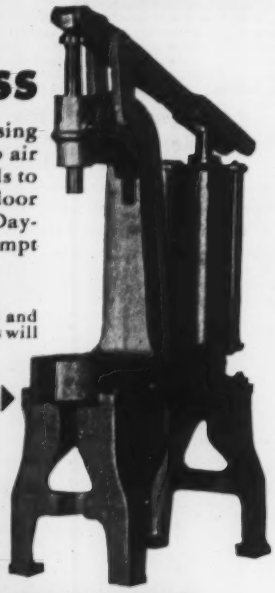
WANTED TO PURCHASE FOR CASH
SMALL STRUCTURAL STEEL FABRICATING PLANT, PREFERABLY LOCATED ON LONG ISLAND OR VICINITY. PLEASE GIVE APPROXIMATE TONNAGE PRODUCED PER YEAR. BOX NO. 487, STEEL, PENTON BLDG., CLEVELAND 13, OHIO.

WANT TO BUY
1000 to 1500 Ton
Hobbing Press
Write Box 484, STEEL
Penton Bldg. Cleveland 13, Ohio

SAVE!

WITH A HANNIFIN AIR PRESS

It's the ideal press for that occasional pressing job. These presses operate off ordinary shop air supply. They're fast and safe. Over 30 models to choose from...many for either bench or floor mounting. Capacities from ½ to 18 tons. Daylight to 46 inches...reach to 12 inches. Prompt delivery.



WRITE. Complete information and prices on Hannifin Air Presses will be sent on request.

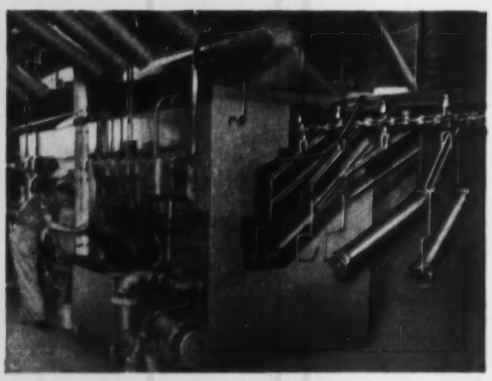
6 Tons (Model B-2) One of more than 30 models. Press with base, $519.

1-ton Hand-D-Press. For small parts manufacturers. Press only, without valves, $232.

Prices F.O.B. our press plant, St. Marys, Ohio, subject to change without notice.

HANNIFIN

HANNIFIN CORPORATION, 523 S. WOLF ROAD, DES PLAINES, ILLINOIS



WHY order a Conveying System from one company—and Cleaning or Processing Machines from another?

ALVEY-FERGUSON is unique among all manufacturers in being able to offer you a Conveying System completely co-ordinated with your Cleaning and Processing Machines . . . all A-F *Engineered* to your plant's requirements.

BEFORE YOU ORDER, write us. Let us prove how the integration of an A-F *Engineered* Overhead Trolley Conveyor System with A-F *Engineered* Cleaning and Processing Machines will move metal parts and products through your plant at the most efficient pre-determined rate of speed for "quality control" and lowest cost production. Write, without obligation, for new A-F brochures—today.

A-F

YOU CAN SEE THE SUPERIORITY OF A-F CONVEYOR ENGINEERING

A-F *ENGINEERED* CONVEYING SYSTEMS

Also Pre-Engineered Conveyors—
Wheel, Trolley, Roller, Belt
Metal Cleaning and Processing Machines

THE ALVEY-FERGUSON CO., 575 Disney St., CINCINNATI 9, OHIO and Azusa, California

Advertising Index

Acme-Newport Steel Co. . . . 176
Ajax Electric Co. . . . 58
Aldrich Pump Co., The . . . 36
Allegheny Ludlum Steel Corporation . . . 208
Allied Chemical & Dye Corporation, General Chemical Division . . . 140
Allis-Chalmers . . . 54, 55
Alloy Steel Casting Co. . . . 198
Alloys & Metal Specialties, Inc. . . . 16
Alter Co., Alloy Metal Division . . . 178
Alvey-Ferguson Co., The . . . 206
American Brake Shoe Co., Denison Engineering Division . . . 62
American Chain & Cable . . . 168
American Chemical Paint Co. . . . 56
American Screw Co. . . . 33
Armco Steel Corporation . . . 76
Associated Spring Corporation . . . 159
Associated Spring Corporation, Wallace Barnes Steel Division . . . 51
Atlantic Screw Works, Inc. . . . 33

Babcock & Wilcox Co., The, Tubular Products Division . . . Inside Front Cover
Baldwin-Lima-Hamilton Corporation, Standard Steel Works Division . . . 69
Barber-Colman Co. . . . 66, 67
Barium Steel Corporation . . . 53
Barnes-Gibson-Raymond, Division of Associated Spring Corporation . . . 159
Barnes, Wallace, Co., Division of Associated Spring Corporation . . . 159
Barnes, Wallace, Co., Ltd., The, Division of Associated Spring Corporation . . . 159
Barnes, Wallace, Steel Division, Associated Spring Corporation . . . 51
Basic, Inc. . . . 139
Bay State Abrasive Products Co. . . . 148, 149
Bearings, Inc. . . . 127
Beatty Machine & Manufacturing Co. . . . 112
Behr-Manning Co., A Division of Norton Co. . . . 27
Bethlehem Steel Co. . . . 1
B-G-R Cook Plant, Division of Associated Spring Corporation . . . 159
Blake & Johnson Co., The . . . 33
Blaw-Knox Co., Foundry & Mill Machinery Division . . . 108, 109
Bliss, E. W., Co. . . . 22, 23
Borg-Warner Corporation, Industrial Crane & Hoist, Ingersoll Products Division . . . 45
Boston Gear Works . . . 167
Bower Roller Bearing Division, Federal-Mogul-Bower Bearings, Inc. . . . 106
Bullard Co., The . . . 145

Cadman, A. W., Mfg. Co. . . . 197
Carborundum Co., The . . . 16, 180, 199
Carborundum Co., The, Stupakoff Division . . . 146
Carpenter Steel Co., The . . . 142, 143
Central Screw Co. . . . 33
Chambersburg Engineering Co. . . . 198
Chandler Products Corporation . . . 161
Chicago Steel Service Co. . . . 136
Chicago Tool & Engineering Co. . . . 198
Cincinnati Milling Machine Co., The, Cincinnati Milling Products Division . . . 11
Cincinnati Shaper Co., The . . . 8, 9
Clearing Machine Corporation, Division of U. S. Industries, Inc. . . . 105
Cleveland Hotel . . . 180
Climax Molybdenum Co. . . . 63
Colorado Fuel & Iron Corporation, The 28, 29, 175
Columbia-Geneva Steel Division, United States Steel Corporation . . . 57
Continental Screw Co. . . . 33
Continental Tool Works, Division of Ex-Cell-O Corporation . . . 4
Coolidge Corporation . . . 99
Crucible Steel Company of America . . . 44

Damascus Tube Co. . . . 198
Danly Machine Specialties, Inc. . . . 155
Denison Engineering Division, American Brake Shoe Co. . . . 62
DoAll Co., The . . . 174
Donley Products, Inc. . . . 198
Drave Corporation . . . 114
Dunbar Brothers Co., Division of Associated Spring Corporation . . . 159
Dyson, Jos., & Sons, Inc. . . . 182

Eastern Machine Screw Corporation, The . . . 197
Easton Car & Construction Co. . . . 169
Elco Tool & Screw Corporation . . . 33
Electric Controller & Mfg. Division of Square D Co. . . . 39
Elwell-Parker Electric Co., The . . . 7
Euclid Crane & Hoist Co., The . . . 169
Ex-Cell-O Corporation . . . 5
Ex-Cell-O Corporation, Continental Tool Works Division . . . 4

Farval Corporation, The ..... Inside Back Cover
Federal-Mogul-Bower Bearings, Inc., Bower Roller Bearing Division 106
Fellows Gear Shaper Co., The 32
Ferguson, H. K., Co., The 137
Firth Sterling, Inc. 111

Gardner-Denver Co. 52
General Chemical Division, Allied Chemical & Dye Corporation 140
General Motors, Hyatt Bearings Division 92
General Motors, New Departure Division 95
Gibson, William D., Co., The, Division of Associated Spring Corporation 159
Gleason Works 163
Great Lakes Screw Corporation 33
Great Lakes Steel Corporation 205
Green, A. P., Fire Brick Co. 203

Hallden Machine Co., The 181
Hannifin Corporation 206
Harbison-Walker Refractories Co. 34, 35
Harnischfeger Corporation, Welding Division 65
Harper, H. M., Co., The 33
Herr Equipment Corporation, The 110
Hobart Brothers Co. 3
Hyatt Bearings Division of General Motors 92

Industrial Crane & Hoist, Ingersoll Products Division, Borg-Warner Corporation 45
Ingersoll-Rand 151
Inland Steel Co. 17, 18, 19, 20
International Nickel Co., Inc., The 72

Jomac, Inc. 98
Jones & Laughlin Steel Corporation 128

Kaplan Trucking Co., The 197

Laminated Shim Co., Inc., Stampings Division 164
Lamson & Sessions Co., The 33
Leeds & Northrup Co. 46
Lincoln Electric Co., The 21
Luria Brothers & Co., Inc. 201

McLouth Steel Corporation 37

Magnaflux Corporation 171
Manross, F. N., & Sons Co., Division of Associated Spring Corporation 159
Martin-Decker Corporation 197
May-Fran Engineering, Inc. 172, 173
Mesta Machine Co. ..... Back Cover
Milwaukee Division of Associated Spring Corporation 159
Monarch Machine Tool Co., The 42, 43
Morgan Construction Co. 87
Morse Twist Drill & Machine Co. 40, 41
Mueller Brass Co. 70, 71
Mundt, Charles, & Sons 207

National Acme Co., The 170
National Lock Co. 33
National Screw & Manufacturing Co., The 33
National-Standard Co. 59
National Steel Corporation 25
New Departure, Division of General Motors 95
Niagara Blower Co. 158
Niagara Machine & Tool Works 30, 31
Nilson, A. H., Machine Co. 118
Norton Co., Behr-Manning Co. Division 27

Ohio Division of Associated Spring Corporation 159
Ohio Steel Foundry Co., The 100

Pacific Tube Co. 13
Parker-Kalon Division, General American Transportation Corporation 33
Pheoll Manufacturing Co. 33, 180
Phillips Petroleum Co. 2
Pines Engineering Co., Inc. 50
Pollock, William B., Co., The 68
Porter, H. K., Company, Inc., Riverside Metal Division 115
Progressive Mfg. Co., The, Division of The Torrington Co. 88
Puerto Rico, Commonwealth of, Economic Development Administration 185

Raymond Manufacturing Co., Division of Associated Spring Corporation 159
Republic Steel Corporation 116, 117
Riverside Metal Division, H. K. Porter Company, Inc. 115
Rockford Machine Tool Co. 60, 61
Roebling's, John A., Sons Corporation, A Subsidiary of The Colorado Fuel & Iron Corporation 175
Rolock, Inc. 166
Roto-Finish Co. 183
Ruby Chemical Co. 199

Scovill Manufacturing Co. 33
Screw Research Association 33
Seaboard Coil Spring Division of Associated Spring Corporation 159
Shakeproof Division Illinois Tool Works 33
Simonds Saw & Steel Co. 64
Southington Hdwe. Mfg. Co., The 33
Square D Co., Electric Controller & Mfg. Division 39
Stamco, Inc. 197
Standard Steel Works Division, Baldwin-Lima-Hamilton Corporation 69
Sterling Bolt Co. 33
Stupakoff Division of The Carborundum Co. 146
Superior Tube Co. 103
Surface Combustion Corporation 165

Tennessee Coal & Iron Division, United States Steel Corporation 57
Thomas Machine Manufacturing Co. 188
Timken Roller Bearing Co., The, Steel & Tube Division 96
Tomkins-Johnson Co., The 12
Torit Manufacturing Co. 6
Torrington Co., The 75
Torrington Co., The, The Progressive Mfg. Co. Division 88

Udylite Corporation, The 10
United States Pipe & Foundry Co., Steel & Tubes Division 14, 15
United States Rubber Co., Mechanical Goods Division 160
United States Steel Corporation, Subsidiaries 57
United States Steel Export Co. 57
United States Steel Supply Division, United States Steel Corporation 57
Universal Screw Co. 33
U. S. Industries, Inc., Clearing Machine Corporation Division 105

Wales-Beech Corporation 33
Washburn Wire Co. 47
Waterbury Farrel Foundry & Machine Co. 38
Wean Engineering Co., Inc., The 48, 49
Weirton Steel Co. 25
Wendt-Sonis Co. 162
Wheelabrator Corporation 186
Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation 28, 29
Wrought Washer Mfg. Co. 78

Yoder Co., The 24
Youngstown Sheet & Tube Co., The 26

Table of Contents, Page 5

Classified Advertising, Page 205

MUNDT

a name with over 83 years experience ready to serve the industry at all times with the

PERFORATED

requirements necessary for your equipment, machinery or parts in any form or types of

METAL

or fibre, cardboard, paper, soundboards and other materials in a workmanlike manner that

MEANS

lasting performance, better quality, and above all a product that will give you a

PERFECT

job for the particular purpose for which it is to be used, without defects, burrs or camber to

SCREENS

because our up-to-date equipment, plus our engineering counsel gives you nothing but the best.

Specially Fabricated for ALL INDUSTRIES BY

CHARLES MUNDT & SONS

53 FAIRMOUNT AVE.
JERSEY CITY 4, N. J.
PHONE—DELAWARE 3-6200

Send for Illustrated Catalog

Rolling up the Miles

Rolling Down the Costs

Write for your copy of "STAINLESS STEEL IN PRODUCT DESIGN"

40 pages of useful engineering and fabricating data, including practical examples showing where, when and how stainless steel improves design, adds benefits, helps sales.

ADDRESS DEPT. S-83

Ask any user: stainless steel trailers *do* roll up extra miles. In fact, they can roll indefinitely because of their great strength and resistance to rust and wear . . . qualities in which *no other metal* matches stainless steel. Of course, that longer operational life means lower over-all expense.

But stainless helps roll down the costs (and UP the profits!) in other ways. It's so strong that thin-wall sections and structural members can be used, permitting greater payload capacity and offering additional savings in operating expenses. Painting isn't needed, and maintenance is cut to a whisper.

Such properties make stainless steel an ideal material for trailers, trains, planes, etc. They qualify it for myriad other applications, too. Chances are that *you* could use it when your product (or process equipment) requires superior strength, corrosion resistance, heat resistance, sanitary qualities, ease of fabrication, durability and attractiveness. ● We'd be pleased to discuss it with you—anytime you say or anywhere you'd like to meet. ***Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.***

WSW 6062 B

Make it BETTER-and LONGER LASTING-with

AL Stainless Steel

AL ALLEGHENY LUDLUM

Warehouse stocks carried by all Ryerson Steel plants

Loewy 50,000-ton "Major" forging press is automatically lubricated by Farval

FARVAL—
Studies in Centralized Lubrication
No. 196

●It takes only one man at the control pulpit to operate this huge 11-story press—the world's largest machine. Designed and built by Loewy-Hydropress Div. Baldwin-Lima-Hamilton of New York for the U.S.A.F. Heavy Press Program and operated by the Wyman-Gordon Co., it can exert 108 million pounds' pressure to form hot aluminum billets into structural parts for jet planes.

Adequate lubrication—and always dependable—helps this machine work to greater precision tolerances than ever before thought possible in a forging press. Lubrication is by Farval—a total of 205 bearings served by four systems—three heavy-duty automatics for the lubrication of the press proper and one manual for the lubrication of the controls.

Farval Centralized Lubrication Systems are serving millions of bearings in all kinds of industrial equipment. Farval is ready to serve you, too. Call the Farval representative near you, or write us for Bulletin 26-R. The Farval Corporation, 3270 East 80th St., Cleveland 4, Ohio.

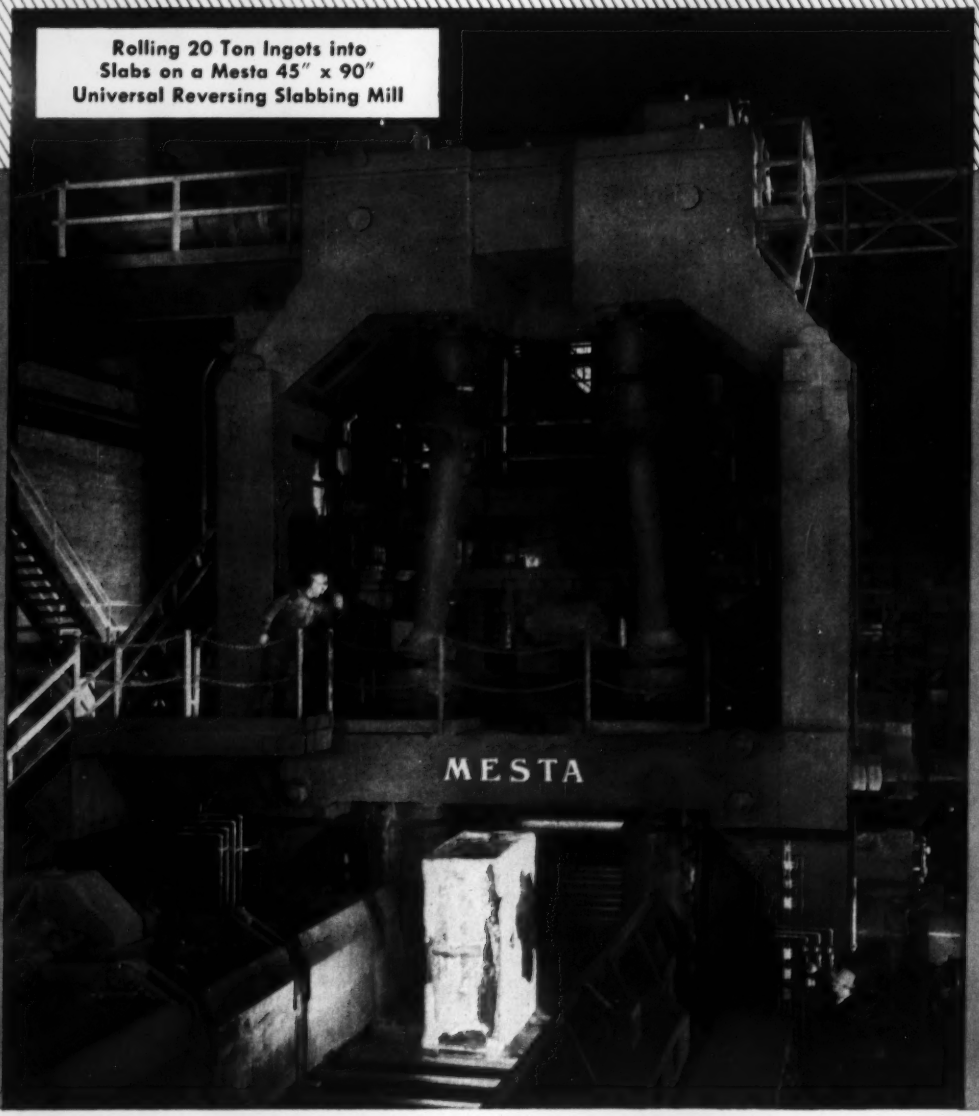
Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

KEYS TO ADEQUATE LUBRICATION—
Wherever you see a Farval central pumping station, dual lubricant lines, and valve manifolds, you know a machine is being properly lubricated.

Three Farval heavy-duty automatic pumping stations that lubricate "Major" are to be seen at lower right.

SLABBING MILLS

Designed and Built by MESTA



Rolling 20 Ton Ingots into Slabs on a Mesta 45" x 90" Universal Reversing Slabbing Mill

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA

PLANTS AT WEST HOMESTEAD AND NEW CASTLE, PA.